



White Paper

Key SaaS Metrics and Benchmarks

Abstract

A white paper from OPEXEngine by Bain & Company on key financial and customer metrics for building high performance, valuable SaaS companies.



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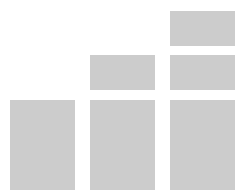
The Software as a Service (SaaS) key performance indicators (KPIs) described here help SaaS vendors analyze performance, build forward-looking growth models, and reduce the risk of underperforming. Data-driven SaaS companies are more likely to achieve high growth rates and the high valuations directly correlated with strong growth when tracking and benchmarking these critical KPIs. In addition, we have found that SaaS investors evaluate investments based on these KPIs.

High performance SaaS management teams are laser-focused on all of the KPIs described in this paper. With greater visibility, companies are better able to make good decisions about efficient and productive resource investments, resulting in revenue growth efficiency. The metrics and data in this paper are derived

from OPEXEngine’s benchmarking of over a thousand software and SaaS companies since 2007. OPEXEngine has developed the largest independent industry database of B2B software and SaaS financial and operating benchmarks.

We acknowledge our debt to the hundreds of industry leaders that we’ve worked with over the years at various stages of company growth who have contributed to our analysis of the key SaaS metrics and benchmarks.

Today, these metrics and benchmarks are used by growth SaaS companies for budgeting, planning, business modeling, and fundraising, whether in the private or public markets.



SaaS Companies Can Forecast Future Performance Better
Than Traditional Software Companies

Perpetual License Model	SaaS Model
Less visibility to the future	More predictive, forward looking
Forecast owned by Sales; sales-driven P&L	Forecast owned by Finance; model-driven P&L
Fewer moving parts, fast moving levers	More moving parts, slow building business
Value of customer relationship drops off after 1st sale; less interaction with customers after first sale	Maintaining customer relationship is key: renewals and upselling ongoing
Customer chooses and pays for all IT to run the software – little impact on vendor’s Cost of Sales	Vendor runs and maintains all software and hardware to deliver SaaS offering – accounted for in Cost of Sales
Can reach profitability relatively quickly but hard to maintain double digit revenue growth at scale	Profitability takes longer to achieve and typically traded off for higher revenue growth, fast rates of customer acquisition and market share. Double digit growth rates are common even at over \$1B in recognized revenues.
Public markets value less highly at 1 - 2 X revenues	Public markets can value at 10 - 40 X revenues

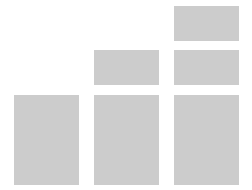
Traditional software companies focus their business modeling on P&L financial metrics such as recognized revenues, operating expenses and profits. Recognized revenues and bookings are viewed as the key metrics to track current and future sales performance. The traditional model has **fewer moving parts** to calculate business performance than subscription businesses and as a result, fewer KPIs. Traditional software KPIs are typically backward looking and provide little visibility into future performance, resulting in lower valuations.

SaaS KPIs are more operationally focused and when combined in a growth model, they can provide a highly accurate model of future performance, which is why the SaaS model is so valued by investors.

Predictability of a SaaS Revenue Forecast

A recurring revenue software – software as a service (SaaS) – business tracks financial and non-financial operating metrics. Taken all together, a SaaS company’s KPIs and historical trends can be built into a forecast model which provides a relatively accurate forward-looking estimate or forecast of revenues.

SaaS recurring revenue and retention KPIs track the addition and loss of subscribers, which is not easily captured through traditional, point-in-time financial metrics. Due to the subscription/recurring revenue model, the revenue forecast is not impacted in the short term by big, new deals coming in at the end of the quarter, or the loss of large customers.



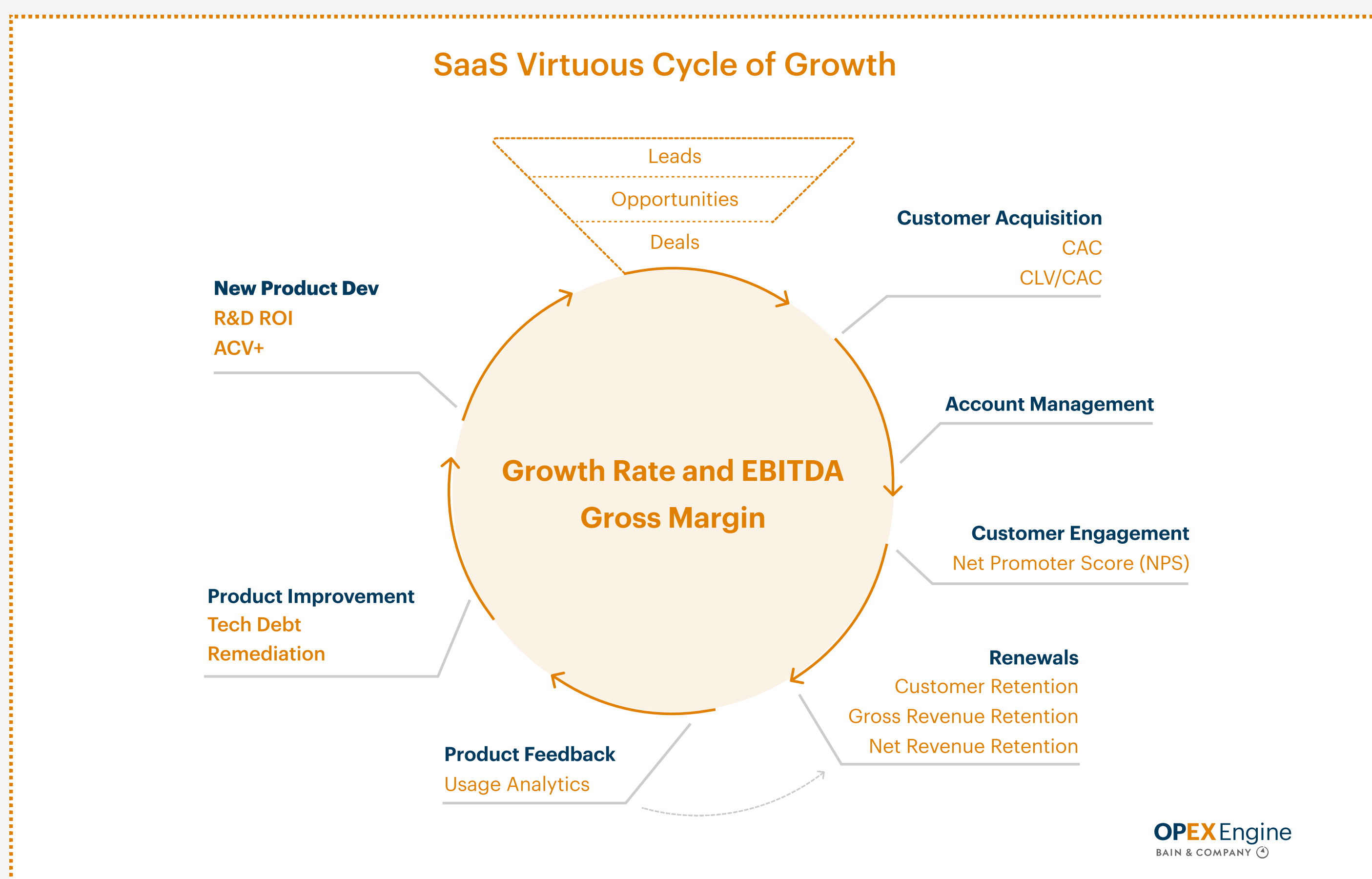
The result is greater predictability and insight into future performance – a major reason why the SaaS model is so valuable. As the subscription momentum builds (the SaaS “snowball”), a typical SaaS revenue forecast should include the following elements:

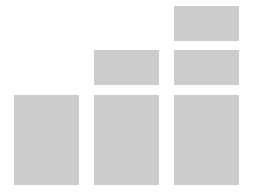
- New contracted subscriptions
- Renewal of existing subscriptions, net of customer churn, and contract contractions
- Expansion of existing customer subscriptions (increased subscription contracts from prior periods)
- Other non-subscription revenue streams, if any, such as one-time services, onboarding fees, etc.



SaaS Companies Have Many Levers for Growth and Managing Costs

In addition to the revenue snowball effect, each function of a SaaS business impacts other areas of the business – new customer acquisition affects customer success metrics and performance, customer success feedback and customer engagement should inform product and R&D roadmaps, product development should impact new customer acquisition, and so forth. Successful SaaS companies look at KPIs in conjunction with each other instead of hyper-focusing on individual KPIs. Overly focusing on one KPI or function at a time can have unintended consequences and impact overall performance because of how connected each function is to the success of the whole business.





The Critical Metrics of a SaaS Growth Model

The most important performance categories to track right from the start of a SaaS business fall into three areas:

1. Recurring Revenue Metrics: ARR and Growth Rate

2. Customer and Unit Economics KPIs

3. Cost, Expense, and, Profitability Metrics

1. Recurring Revenue Metrics

- Contracted Monthly (CMRR) or Contracted Annual Recurring Revenues (CARR)
- Recurring Revenue Growth Rates
- Bookings
- Average Contract Value (ACV)

Contracted Monthly and Contracted Annual Recurring Revenues (CMRR and CARR)

Whether tracking monthly or annual contracts, CMRR or CARR is the first major KPI that any SaaS vendor monitors and works to calculate correctly. Changes in recurring revenue growth provides the clearest visibility into the health of a SaaS business.

Contracted Recurring Revenues tracks only subscription revenue which is contracted and excludes one-time charges which add to overall revenue, but are not recurring. It is important to make sure that revenue tracking systems identify contracted recurring revenues separately from other revenue streams. One important facet of CMRR/CARR is that it is a measure *at a point in time* – much

like a Balance Sheet item – as opposed to an Income Statement metric like Revenue which requires a duration of time.

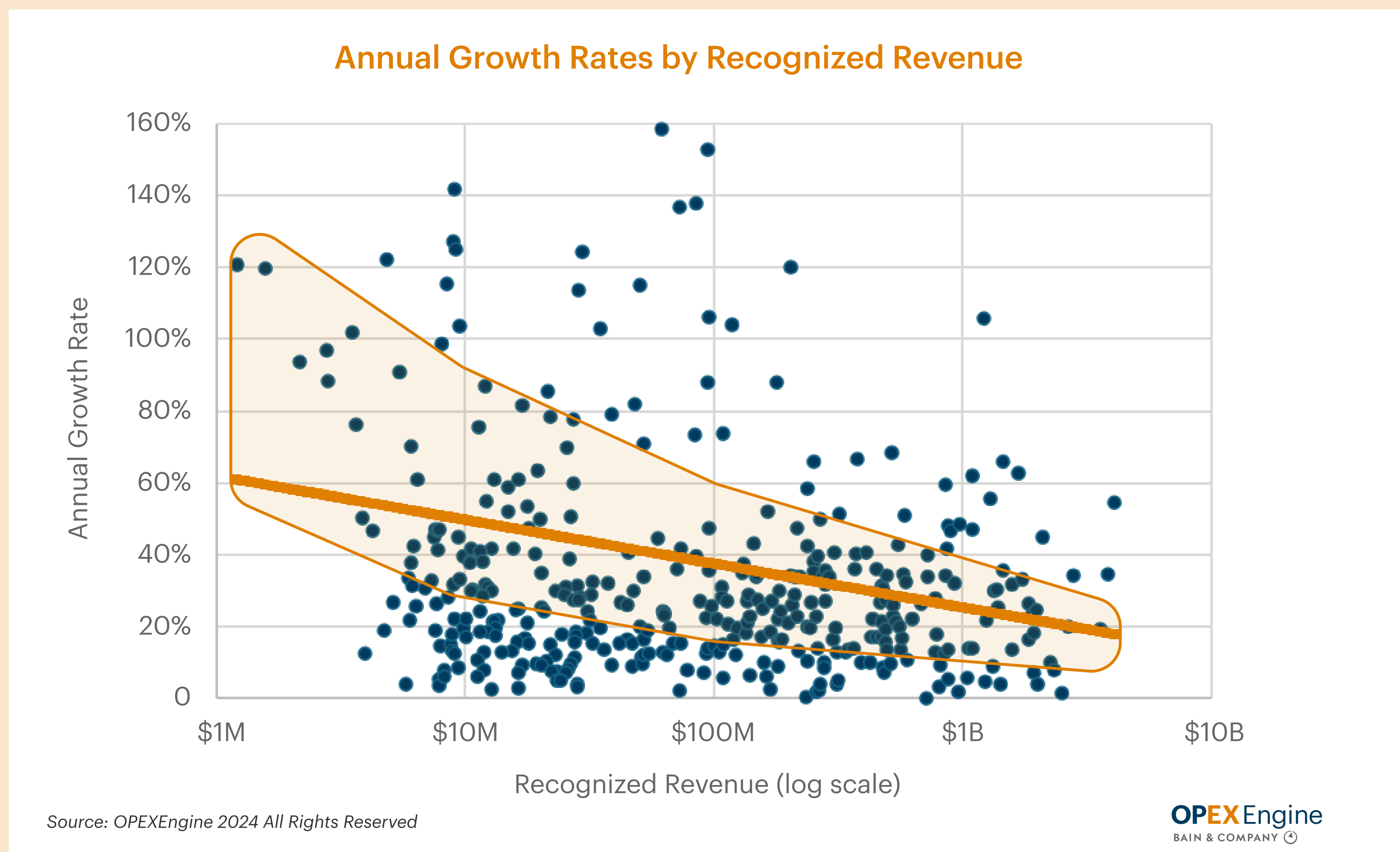
One can calculate CMRR/CARR at any particular point in time and should reference a specific year, month, etc.

The difference between CMRR and Monthly Recurring Revenue (MRR) is that CMRR tracks revenue which is contracted indefinitely, whereas MRR may include short-term recurring revenues that are not contracted long-term and thus may distort the view into on-going, future revenues. However, CMRR and MRR are not defined by GAAP or an industry standards organization, so each company may define these metrics somewhat differently than the next company.

Be cautious when benchmarking without understanding the definition of CMRR and MRR used in the benchmarking. Committed ARR is a term that is used synonymously with Contracted ARR (CARR).

Recurring Revenue Growth Rates

Private SaaS companies have shown a consistent trend, on average, of healthy revenue growth rates, once they've established product/market fit. SaaS valuations are consistently tied to strong growth. Revenue growth rates continue to be the leading indicators of company value for both public and private SaaS companies.



SaaS growth rates are calculated as the change in revenue from one period to the next, whether that is monthly, quarterly or annually. Compound annual growth rates (CAGR) represent the average annual growth rate over more than one year, typically three years. CAGR evens out one time growth rate increases (or decreases) caused by unique events.



Because of the snowball effect of SaaS recurring revenues, SaaS growth rates tend to be higher than traditional software and other industries. Gartner predicts continued growth of the SaaS industry overall of almost 20% year over year.

Bookings

The definition and calculation of Bookings varies widely among SaaS companies. We recommend that if your company calculates Bookings as Recognized Revenue or as CMRR or CARR, then it is preferable to use those KPIs, as they are more generally accepted and standardized.

At OPEXEngine, we track Bookings as Total Contract Value sold in a year. For benchmarking purposes, we use the one year value of a multi-year contract to compare apples to apples from one company to another. Calculating Bookings for an individual company could include the full value, including multi-year contracts, of contracts signed during the year, or time period specified.

Bookings value represents the aggregate of Total Contract Values in a period, including recurring revenues, one-time charges, professional services, and any other revenue items included in the contract.

Average Contract Value (ACV)

ACV is a measure of the average contract value generated per customer. This is similar to Average Revenue per Subscriber (ARPU) for B2C companies. This metric allows for the analysis of a company's revenues and growth at a per customer level.

SaaS average contract values can be calculated both for the average recurring revenue contract values, as well as for total contract values, which would include one-time charges, professional services, and other charges.

OPEXEngine benchmarking uses the full contract value in its calculation of ACV but normalizes for the one year value in order to aggregate like values for benchmarking purposes.

It is recommended to calculate ACV as a whole for all of the company's customers, and then conduct cohort analysis for various customer segments, whether by products purchased, by geography, by the start date of the subscription, etc. Cohort analysis provides important insights into profitable and unprofitable segments, customers, markets and sales. Improvements can be made at the segmentation level in order to improve overall company ACV. It is important to do both total company and cohort ACV analysis in order to understand how the parts contribute to the whole.



2. Customer and Unit Economics KPIs

- Customer Acquisition Cost (CAC)
- Customer Lifetime Value (CLV)
- CLV/CAC Ratio
- Cost of Maintaining a Customer
- Customer and Contract Retention KPIs
- Customer Segmentation

Customer Acquisition Cost (CAC) and Customer Lifetime Value (CLV)

CAC and CLV are two of the most critical SaaS metrics in determining whether a SaaS business is building a profitable business or not by looking at how much it costs to acquire a customer compared to the lifetime value of a customer.

Customer Acquisition Cost (CAC)

CAC includes all expenses associated with acquiring new customers. In small and mid-sized companies, CAC is typically calculated as all sales and marketing expenses from a previous quarter (or whatever time period roughly represents the average sales cycle) divided by the number of new customers in a quarter.

CAC for larger SaaS companies will be more complicated to calculate than simply dividing sales and marketing expense by the number of new customers acquired. Some sales and marketing expense will be dedicated to maintaining, renewing, and expanding sales to existing customers – this expense should not be included in CAC.

Beyond early stage, it is recommended that a company's chart of accounts be set up to help define CAC expenses.

Companies offering free products, such as those delivered by Product-Led Growth (PLG) companies, should add the full cost of free products to CAC as their purpose is for lead generation, which would typically be a marketing expense.





Customer Lifetime Value (CLV)

CLV – equivalent to Lifetime Value (LTV or CLTV) – is the amount of profit a customer is calculated to deliver to the company over the lifetime of the customer relationship. The inverse of retention, customer churn, is used as a proxy for the “lifetime” of an average customer. The simple formula for calculating CLV is:

$$\text{CLV} = \frac{\text{Average CARR per Customer} * \text{Gross Margin}}{\text{Customer Churn}}$$

CLV is extremely powerful in helping to understand how much a company can profitably spend to acquire and retain customers, as well as to segment profitable from unprofitable customer groups.

In general, these metrics are less meaningful when looked at in isolation and most meaningful in relation to each other. For example, a high CAC is fine if CLV is also very high, whereas a high CAC and lower CLV would clearly be an unprofitable business. Looking at one without the other only gives half the picture.

CLV/CAC Ratio

The CLV/CAC Ratio answers the question of: how much more is a customer worth than their acquisition cost? A minimum of a 3:1 CLV/CAC Ratio is a good target ratio, though it will vary based on the customer segment and average contract value. A CLV/CAC ratio of 5:1 is generally a top quartile performance and portrays a profitable SaaS subscription model.



Cost of Maintaining a Customer

Cost of Maintaining a Customer usually includes 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. Typically, this includes all the fully loaded costs that go into Cost of Goods (for the recurring revenue). The difference between this metric and the above CLV metric is that this is the annual cost of maintaining a customer, as compared to the net profit from a customer over their lifetime. This metric is expressed per customer, so the calculation would be:

Average Cost of Maintaining
a Customer

=

(The recurring cost of engineering, support, account
management, customer service/success, and billing
activities **plus** all physical infrastructure and systems
required to maintain a current customer)

Total Number of Customers

The time period for the expenses in the numerator and the customers in the denominator should be the same.

As SaaS revenues grow, the costs of Sales, Marketing, and R&D associated with customer management will change, and the chart of accounts for OPEX (new customer acquisition and new contracts) and COS (supporting existing customers) and other items associated with all of these KPIs will evolve and change. It is important to review the Chart of Accounts as it relates to CAC inputs, OPEX, and Cost of Services on an annual basis.



Customer and Contract Retention KPIs

Retention KPIs are critical in managing and growing recurring revenue. By tracking the retention of customers and customer contracts, a company can improve and expand its existing customer relationships to maximize the lifetime value of its customers.

A subscription company with a high churn rate is fundamentally less valuable than one with a long customer life. The higher the churn rate, the slower the growth – like driving a car which is leaking gas.

OPEXEngine tracks renewal rates for subscription-based products by three retention (retention is the inverse of churn) KPIs:

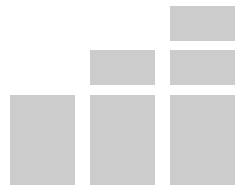
1. Customer retention rate (CRR)
2. Net revenue retention rate (NRR)
3. Gross revenue retention rate (GRR)

Ideally, SaaS companies target renewal rates in the 90+% range, but this varies by SaaS growth stage and by customer type, particularly between SaaS vendors selling to the SMB market versus SaaS vendors selling to enterprise customers. Renewal rates will vary by different customer groups, so it is important to segment customers by a variety of profiles, for example, by industry, size of company, deal size (whether large deals are more or less likely to churn than small deals), or by length of subscription, among other segmentation definitions.

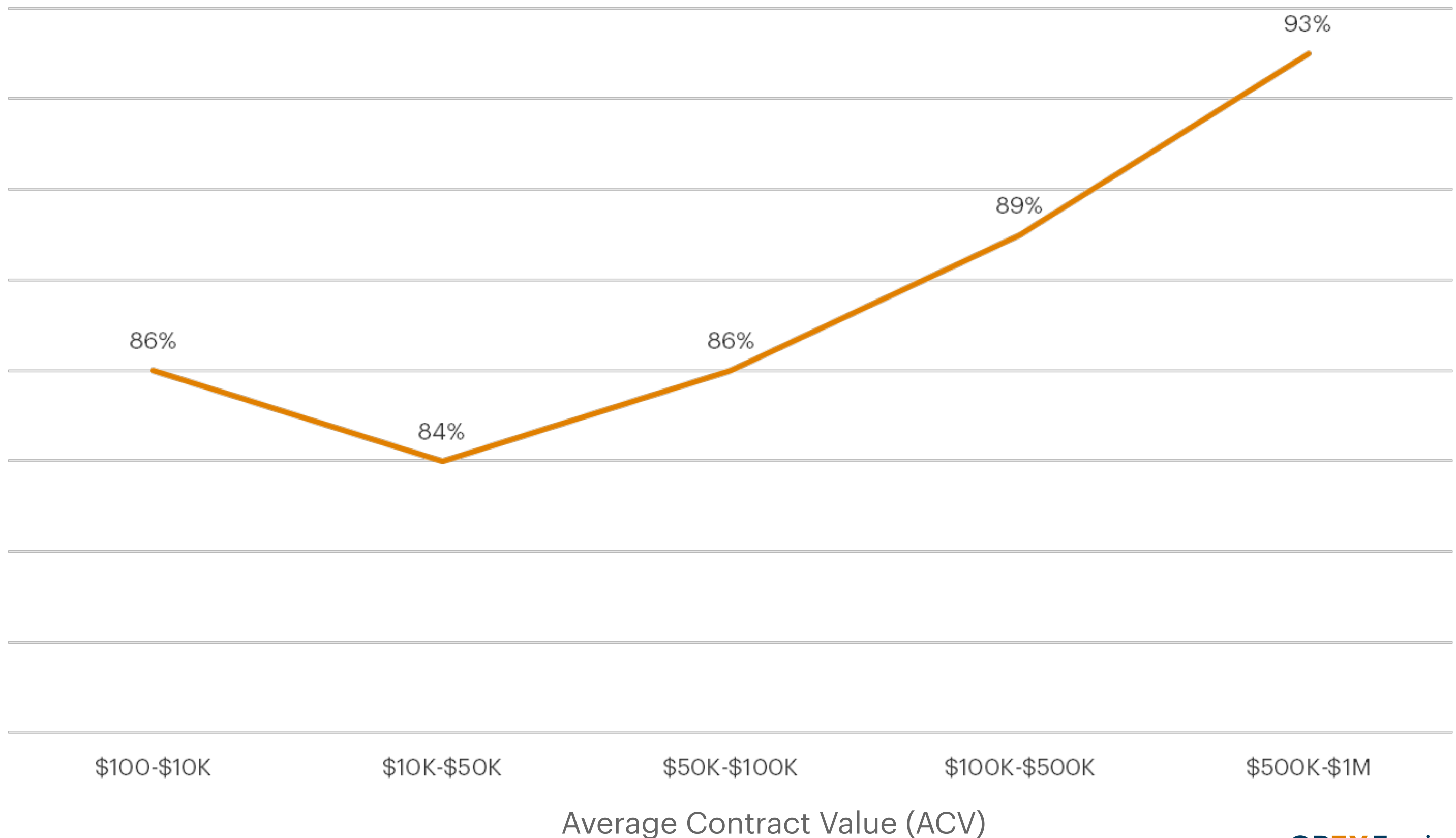
In general, retention benchmarks show that:

- Early stage companies have higher churn rates than bigger SaaS companies; and
- SaaS companies selling a low priced product (lower average deal size), regardless of size, have a higher churn rate than companies selling higher priced, enterprise type software subscriptions.
- Low ACV products have more variability in customer retention rates, and may range from 60%-85%.
- High ACV products typically have high 90s% customer retention rates.





Top Quartile Customer Retention Across ACV Ranges



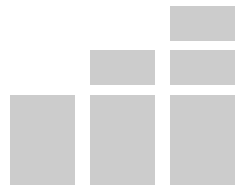
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Typically, enterprise type sales have a longer sales cycle, which tends to correlate with lower churn once the customer has made the decision to enter into a subscription relationship with the vendor. Both the vendor and enterprise customer have invested a greater amount of time and resource into the relationship, hence, there is less churn. Enterprise SaaS applications tend to be integrated with complex, internal operations and other systems and in this way are more “sticky” and difficult to displace.

Customer Retention Definition and Calculation

Tracking and benchmarking Customer Retention rates is crucial to understand the effectiveness of customer retention efforts.

Customer retention is defined as the number of unique customers who are retained on a subscription contract from the beginning of a specified subscription time period to the beginning of the next subscription time period. The subscription contract value may have increased or decreased.



$$\text{Customer Retention} = \frac{(\text{\# of the period 1 customers on contracts at the end of period 2})}{(\text{\# of unique customers on contracts at the end of time period 1})} \times 100$$

Customer Retention can never be greater than 100%.

Net Revenue Retention (NRR) or Net Dollar Retention (NDR)

NRR – also known as NDR – measures the percentage of recurring revenue retained over a specific period. NRR captures lost revenue due to customer attrition, reduced usage, or decreasing subscription level, offset by increased revenue from existing contracts through up-sells, cross-sells, price increases, or increased usage. The term “net” is used because lost revenue is “netted” against expansion revenue.

NRR is a critical SaaS metric because it directly measures the retention and growth potential from customer contracts. SaaS businesses with high NRR over 100% have higher growth potential and churn is not reducing the net value of customer contracts.

NRR can be greater than 100% due to a greater expansion of contract values than any reduction due to contract contractions or churn.

NRR Calculation

For this calculation, it’s important to use revenue and not bookings, billings, or cash accounting. Monthly Recurring Revenue (MRR) for monthly changes in NRR can be used for this calculation. Enterprise SaaS companies with longer contracts and implementation cycles typically use Annual Recurring Revenue (ARR) or Contracted ARR (CARR).



Any new customer contracts acquired over the year are excluded from the calculation.

The calculation is made by subtracting the value of ARR/CARR or MRR at the end of the previous period from the value of ARR/CARR or MRR at the end of the current period for the same group of customers, and expressing as a %.

NRR %

=

(ARR at end of current period – ARR for the same group of customers at the end of the previous period)

ARR for the same group of customers at the end of the previous period

x 100

NRR should be calculated for all of a company’s customer contracts, providing an average NRR for the customer base as a whole. In order to improve overall NRR, and understand which customer groups provide the most opportunity in terms of retention and expansion, the cohort method delivers a more granular level of accuracy for specific cohorts of customer NRR. By identifying poor performing customer cohorts, companies can shift focus and resources to better performing customer groups and improve overall company NRR.

Gross Revenue Retention

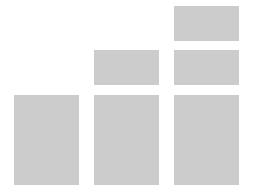
Gross revenue retention eliminates the impact of cross-selling, up-selling, price-increases, and organic customer growth within the installed customer base. It is an important indicator of how the company is really doing in retaining revenue from its customers over time.

Gross Revenue Retention Calculation

The basic calculation is the same as NRR, however, the ARR for each individual customer in the current month cannot exceed the ARR for that customer from one year ago. This approach eliminates the impact of all the factors mentioned above.

The value of the subscription contracts from a cohort of customers at the end of one time period is compared to the value of those same contracts, without including any contract expansion, but including any contraction of value at the end of the second time period. Gross revenue retention is always equal to or lower than customer retention and cannot be greater than 100%.





3. Cost, Expense, and Profitability Metrics and Rule of 40

- Cost of Revenue
- Sales and Marketing Expense
- EBITDA
- Gross Margin
- Rule of 40

Key expense, cost and profitability metrics include the cost of revenue, sales and marketing, as well as R&D and G&A expense, EBITDA, and Gross Margin.

Total Cost of Revenue

The cost of revenue is the key component of gross margin which for SaaS companies typically falls in the range of 70-80%.

Expenses to be included in the calculation of the Cost of Products and Services: all direct expenses related to making or acquiring products that have been sold, including all fully loaded compensation associated with product management and administration, plus direct overhead for the production of software or SaaS products, including hosting and monitoring of the application. Cost of Revenue includes all costs associated with delivering services to customers, including all compensation associated with services management and administration, professional services and consulting delivery, education, and training, as well as customer or technical support.

Customer Success (CS) can be accounted for

either in OPEX or Cost of Revenue, depending on what CS is specifically responsible for. Usually, if CS is responsible for renewals with commission or bonus based variable compensation, CS will be accounted for in OPEX. If CS is mostly responsible for customer satisfaction and engagement, and not directly selling, then CS expense falls under Cost of Revenue. Many SaaS companies allocate some portion of CS to OPEX and another portion to Cost of Revenue.

Sales and Marketing Expense from Early Stage to Public Company

SaaS companies typically spend more in Sales and Marketing than traditional software companies because the SaaS model is all about acquiring and retaining customers. Public SaaS companies tend to maintain higher spending rates in Sales and Marketing. Successful public SaaS companies are spending in the range of 45-55% of revenues on Sales and Marketing to continue to achieve



high growth rates. On-premises software companies, in contrast, tend to reduce the percentage of revenues spent on S&M.

EBITDA

EBITDA stands for Earnings Before Interest, Taxes, Depreciation, and Amortization. It is a financial metric used to measure a company's profitability and cash flow.

To calculate EBITDA, start with a company's revenue and subtract its operating expenses and cost of revenue (CORS), excluding interest, taxes, depreciation, and amortization. This metric is often used to evaluate a company's performance without the potentially distorting effects of non-cash expenses such as depreciation and amortization, as well as expenses related to taxes and interest payments.

EBITDA has become an increasingly popular metric in the financial world, particularly with private equity firms and investors, as it provides a way to compare companies across different industries and sizes. However, it should be noted that EBITDA is not a comprehensive measure of a company's financial health as it does not take into account factors such as working capital and capital expenditures. It is often used in conjunction with other metrics to provide a more complete picture of a company's financial performance.

Gross Margin

Gross Margin Percentage on Product Sales is a financial metric that represents the percentage of revenue generated from the sales of products after accounting for the cost of goods sold.

$$\text{Gross Margin \% on Product Sales} = \frac{(\text{Product Sales} - \text{Product Cost of Goods Sold})}{\text{Product Sales}} \times 100$$

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The Gross Margin Percentage on Product Sales metric is an important indicator of a business' profitability because it determines the amount of money that the business retains after the cost of goods sold is deducted. When the Gross Margin Percentage on Product Sales is high, it indicates that the business is able to generate more profit from its product sales and has better pricing power. Conversely, a low Gross Margin Percentage on Product Sales suggests that the business is not generating sufficient profit and may need to consider adjusting its pricing strategy or reducing costs.



Rule of 40

The Rule of 40 is a popular financial metric used in the SaaS industry to evaluate the health and performance of SaaS companies. It provides a simple way to assess whether a SaaS company is achieving a balance between growth and profitability.

The Rule of 40 states that the combined growth rate (measured as the percentage increase in annual recurring revenue or ARR) and the company's profitability margin (measured as the percentage of Earnings Before Interest, Taxes, Depreciation, and Amortization or EBITDA margin) should equal or exceed 40%.

Mathematically, the Rule of 40 is represented as: $\text{Growth Rate} + \text{Profitability Margin} \geq 40\%$

Here's a breakdown of the components:

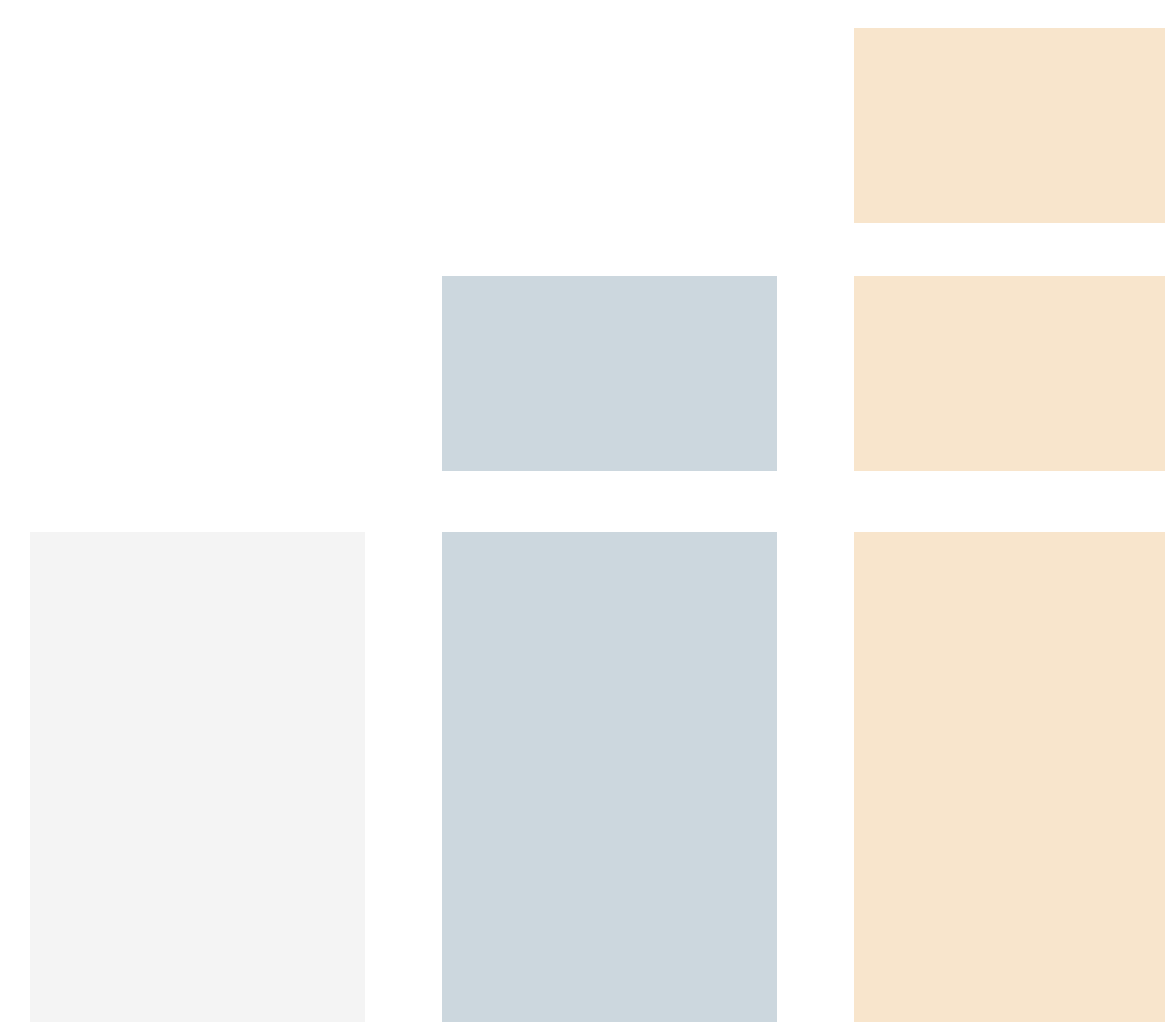
Growth Rate: This represents the rate at which a SaaS company is increasing its annual recurring revenue (ARR). ARR is a crucial metric for SaaS companies as it reflects the total amount of predictable and recurring revenue from subscriptions over the course of a year. The growth rate is usually measured on a year-over-year basis.

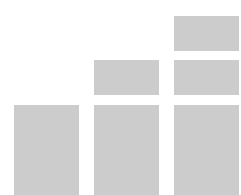
Profitability Margin: This refers to the company's profitability, specifically its EBITDA margin. EBITDA (Earnings Before Interest, Taxes, Depreciation, and Amortization) is a measure of a company's operating

performance, excluding certain expenses that can vary widely between different companies or industries. The profitability margin is calculated as the ratio of EBITDA to total revenue, expressed as a percentage.

The Rule of 40 suggests that a SaaS company can prioritize growth over profitability or vice versa, as long as the combined result meets or exceeds 40%. For example, a company with a growth rate of 30% and a profitability margin of 20% would meet the Rule of 40, as $30\% + 20\% = 50\%$.

However, it's essential to note that the Rule of 40 is not a strict rule but rather a guideline. Some companies might prioritize growth over profitability in their early stages, while others may focus on achieving profitability first before prioritizing growth. Additionally, factors such as market conditions, competition, and the stage of the company's lifecycle can influence how the Rule of 40 is interpreted and applied. Nonetheless, it serves as a useful benchmark for investors and executives to assess the overall health and performance of a SaaS company.





Systems and Automation to Provide Visibility Into the Business and Course Correct

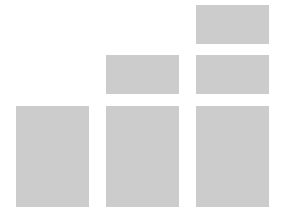
Accurate and real time visibility through an automated financial system and recurring revenues is critical to track the KPIs discussed in this paper. The ability to compile the data across the organization and benchmark it in an automated fashion allows a company to scale operations quickly and efficiently.

As SaaS companies grow, the amount of data and KPIs to calculate also grows. Investors will require strict reporting and expect a company to have flexible and accurate systems in place to provide visibility in KPIs. These non-financial but critical operating metrics become especially difficult to accurately track manually or with simple spreadsheet tools and investors will judge a company by the level of responsiveness to reporting requests.

Once the correct tracking of key SaaS metrics is in place, then benchmarking them against peers and market leaders gives companies insights into whether their performance is good, great, or below average and needs focus. Benchmarking these metrics provides “early warning” signals internally about performance problems which may be corrected, once identified, to get back on track.

Comparisons with peer companies allow management teams to quickly identify problem areas, set targets for improvements, and further support areas of the business that are already over-achieving against peers. This in turn drives the strong revenue growth which underpins highly valued companies.





About OPEXEngine

OPEXEngine is the leading performance benchmarking solution for SaaS and software companies.

For nearly 20 years, OPEXEngine has connected many of the world's leading SaaS brands to validated insights that improve performance and operational efficiency.

Acquired by Bain in 2021, OPEXEngine enables performance benchmarking at scale with a cutting-edge software platform, a dataset of many of the world's leading private and public technology companies, tracking of 500+ metrics, and unmatched expertise.

For more information about OPEXEngine benchmarking please contact us at info@opexengine.com.

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