How Public SaaS Companies Report

Dollar-Based Net Retention Rate

Research study by

ORDWAY

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PREFACE:
COMPARABILITY IN REPORTING

One of the primary goals of net retention metrics is to enable investors to perform comparisons between different SaaS companies. Specifically, net retention metrics help investors understand which companies are able to expand their customer base over time by upselling more existing services and cross-selling new services.

Healthy SaaS businesses will be able to expand revenue from current accounts at a faster rate than they are losing revenue from churn, thus achieving a net retention metric of greater than 100%.

However, retention metrics lose their usefulness for comparability, when companies use different formulas and methodologies to calculate the numbers.

Most of the popular SaaS metrics (ARR, Rule of 40, CAC) have multiple different variations in use. ARR can be calculated using contracted MRR x 12 or by annualizing GAAP revenue. Rule of 40 can be calculated by summing ARR + FCF or GAAP revenue + EBITDA.

However, net retention metrics have far more permutations in use than any of the other SaaS KPIs. In 2019, Keybank published 110 different approaches that were in use by public SaaS companies to calculate retention metrics, which highlighted the divergence in approaches.

In this report we will explore, in-depth, the varying approaches taken by public SaaS companies to calculate net retention metrics

NET RETENTION MEASURES

- SaaS company's ability to grow and retain existing customers
- Measures expansion, contraction, and churn
- Does not include new business

NET RETENTION CACLUATION

- Compares recurring revenue for a cohort of customers between a base period and the current period

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INTRODUCTION

1.1: THE IMPORTANCE OF RETENTION METRICS

For SaaS companies, the ability to raise venture capital, growth equity, or from the public markets in an IPO, depends on reporting strong operating metrics. Dollar-based net retention rate (net retention) is one of the three top operating metrics that SaaS companies report to investors. High net retention rates, along with strong ARR, gross margin, LTV/CAC, and other KPIs, will improve the company's attractiveness to investors and the value of the equity owned by the employees. Numerous studies have demonstrated a strong correlation between a company's valuation (e.g., the Enterprise Value/Revenue ratio), and higher net retention rates.

INVESTOR CHALLENGES

The complexities of recurring revenue businesses make it challenging to understand the drivers of growth at SaaS companies. Two SaaS companies could be growing at equal rates but in different ways. One company might be churning a lot of revenue but offsetting the losses by spending a lot of money to acquire new customers. A second company might not be acquiring many new customers, but instead growing from upselling existing accounts. It can be challenging to understand these dynamics by simply looking at the topline revenue growth.

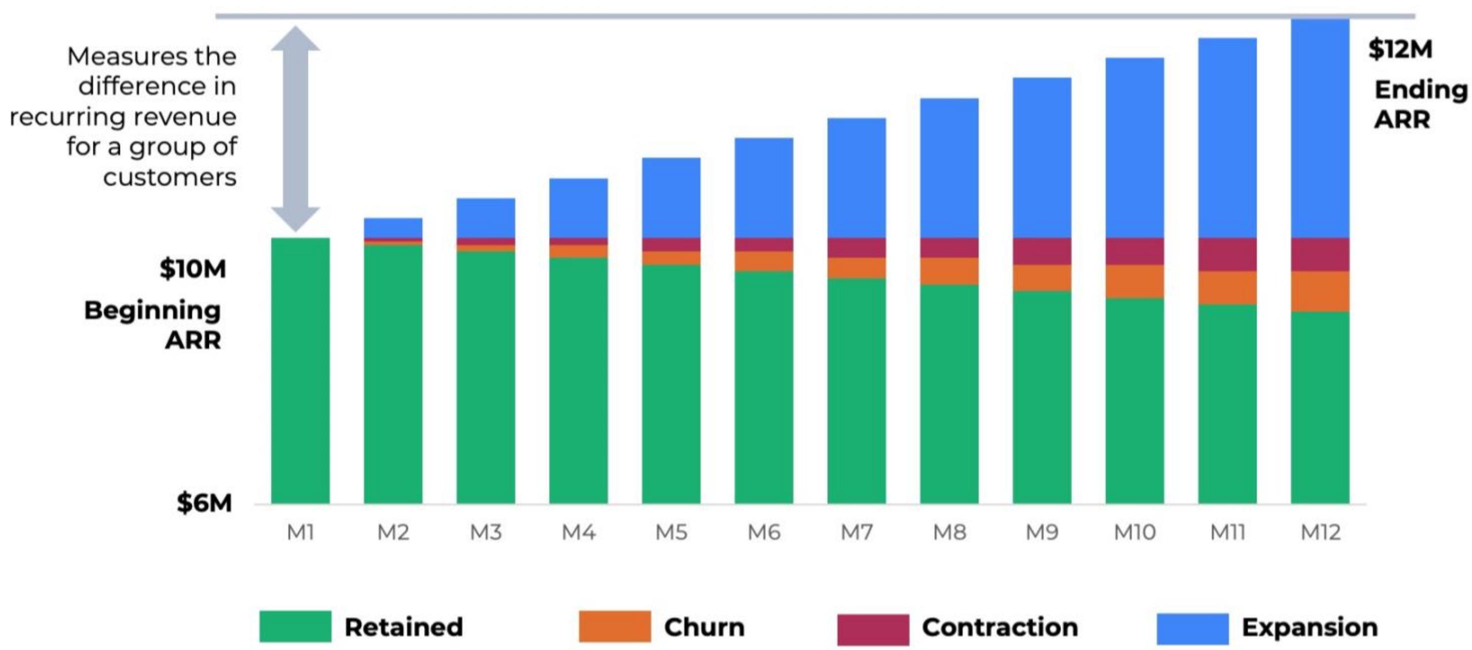
Net retention metrics help investors and senior management understand where growth is actually coming from. The metric separates the expansion and retention aspects of the business from the new customer acquisition processes.

To calculate the net retention rate, a SaaS company measures the amount of recurring revenue generated from a specific group of customers in a prior year (e.g., year 1) and then compares it to the dollars of recurring revenue generated from the same group of customers in the current year (e.g., year 2). For the group of customers, net retention measures the net difference between the amount of upsell (expansion) revenue and the losses due to churn and contraction (downgrades).

NET RETENTION RATE EXAMPLE

For example, suppose a SaaS company generated $10M in annual recurring revenue (ARR) from a group of 1,000 customers last year (e.g., year 1). To calculate net retention, we would measure how much ARR that same group of 1,000 customers generated this year (e.g. $12M). In this case, the net retention rate would be 120%. It is calculated by taking the current year's revenue of $12M divided by last year's revenue of $10M.

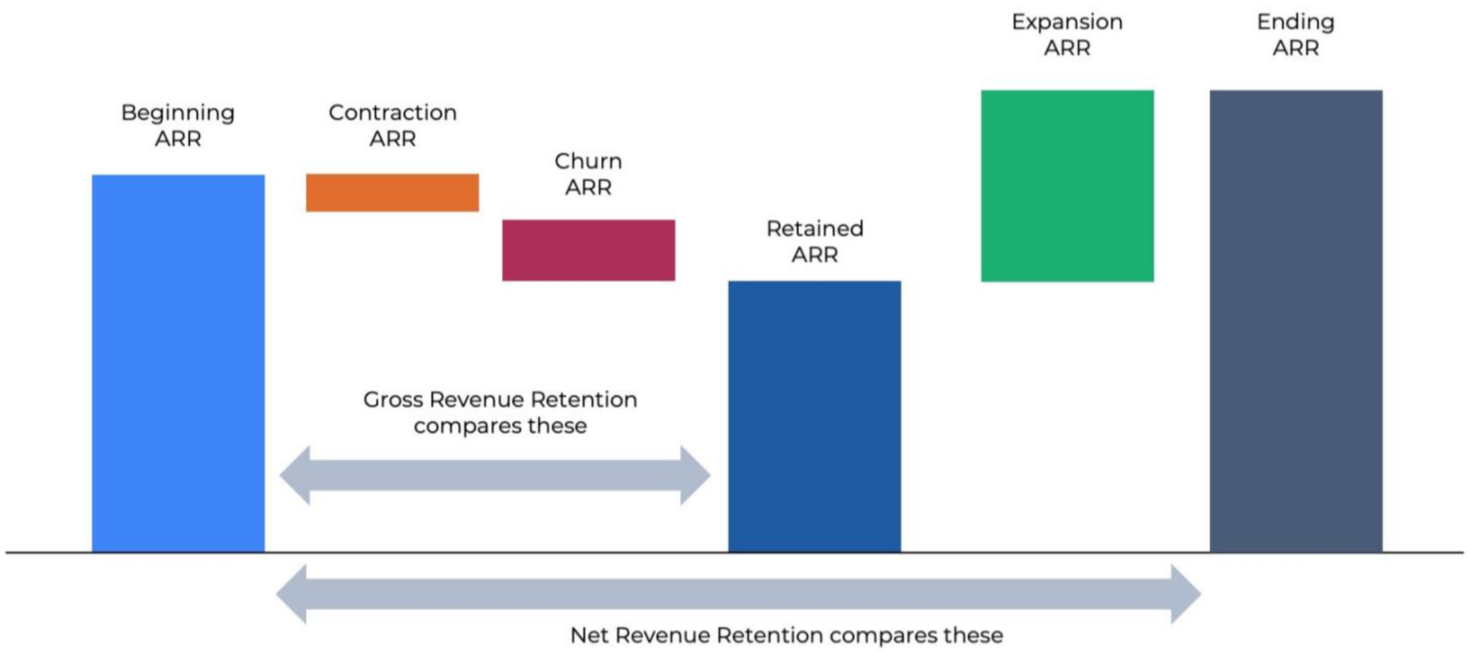
Figure N – Example Net Retention Rate



GROSS VS NET RETENTION

Increases or decreases in retention metrics are driven by three revenue dynamics: 1) expansions (upsells), 2) contractions (downgrades), and 3) churn (cancellations). Net retention measures the impact of all three on a given customer group. A similar metric, gross retention, measures the impact of just two dynamics - contractions and churn. Gross retention tracks the ability to retain revenue, while net retention tracks the ability to retain and expand revenue. Gross can never be higher than 100% while Net should be over 100% for healthy businesses. The three different revenue dynamics and their correlation to retention metrics are illustrated in the diagram below.

Figure N –Gross vs Net Retention



RETENTION MOVEMENTS

The chart below shows how changes to product mix, contract terms, and pricing levels drive different types of recurring revenue "movements" - new, expansion, contraction, and churn. It also shows which of these movements are included in gross versus net retention.

Recurring Revenue	Customer Relationship	Impact to Revenue	Examples	Gross Retention	Net Retention
New	New account	Positive	– Initial sign up for paid – Monthly to annual contract* – Freemium to paid – Free trial to paid	Excluded	Excluded
Expansion	Existing account	Positive	– Additional product(s) – Annual price increase – Additional users – Tier upgrade (good to better)	Excluded	Included
Contraction	Existing account	Negative	– Remove product(s) – Price decreases – Removed users – Tier downgrade (better to good)	Included	Included
Churn	Existing account	Negative	– Cancel and close account – From annual contract to monthly* – From paid to freemium	Included	Included

**Some SaaS companies may include monthly plans in the base cohort of customers, in which case, changes to/from monthly to annual plans would be expansions and contractions (versus new and churn as outlined above).*

EXAMPLE OF KEY FACTORS DRIVING RETENTION MOVEMENTS

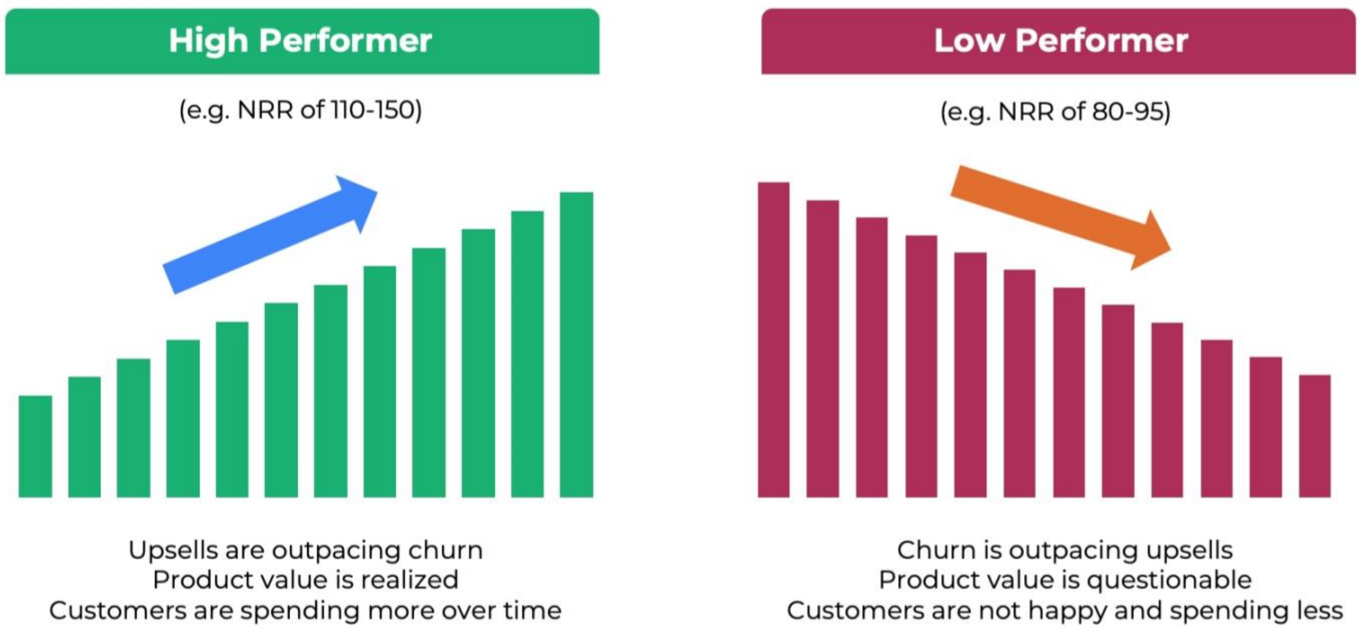
*"Our Dollar-Based Net Expansion Rate increases when our customers **increase usage** of a product, extend usage of a product to new applications or **adopt a new product**. Our Dollar-Based Net Expansion Rate decreases when our customers cease or **reduce usage** of a product or when **we lower prices**."*

Agora

LOW VERSUS HIGH PERFORMERS

A low retention rate (below 105) indicates a high level of churn and/or an inability to upsell existing accounts. High churn indicates a problem with the product functionality or customer experience. Low expansion rates indicate an ineffective upsell/cross-sell motion and/or a customer satisfaction problem. The existence of any of these problems could be an inhibitor to future growth.

Figure N – High vs Low Performance in Retention



A high retention rate (above 105) indicates that most customers are happy and growing their adoption of the product. Every SaaS business will have some level of churn, but higher retention rates indicate that the churn is more than offset by upsells of additional user seats and cross-sells of new products.

BENCHMARKS FOR SAAS COMPANIES

In the previous section we used the 105 benchmark to differentiate between a low and high performer. However, the optimal range for a specific SaaS company varies by the age of the company and its size. Earlier-stage companies with less than $10M in revenue tend to have higher retention rates in the 105-145% range. As a company grows, the law of large numbers starts to kick in. It is much harder to grow a group of 25,000 customers generating $100M ARR by 30% than it is to grow a group of 250 customers generating $10M by 30%. SaaS companies with revenues greater than $100M tend to have slightly lower NRRs in the 105-125% range.

Figure N – Net Retention Benchmarks by ARR Range

	$1-$10M	$10-$25M	$25-50M	$50-$100M	$100M+
Top 25%	145%	135%	130%	135%+	125%+
Middle 50%	105-145%	100-135%	105-130%	105-135%	105-125%
Bottom 25%	<105%	<100%	<105%	<105%	<125%

Source: Bessemer Venture Partners

Median	<$10M	$10-$25M	$25-50M	$50-$100M	$100M+
2022	104%	114%	108%	107%	107%
2023E	100%	106%	104%	102%	108%

Source: KeyBank Sapphire Ventures

KeyBank, Sapphire Ventures, Bessemer Venture Partners, and several analysts publish regular benchmarks of both public and private company retention rates.

1.2: STUDY GOALS AND FIRMOGRAPHICS

KEY QUESTIONS TO ANSWER

The purpose of this study is not to benchmark retention rates, but instead to better understand how net retention is defined, calculated, and reported at publicly traded SaaS companies. The value of operating metrics like net retention is to enable investors to compare the health and performance of different SaaS companies. However, that value is diminished if companies use different formulas and approaches to measure retention.

In December 2023, the Ordway research team analyzed the financial reports of all the publicly traded SaaS companies to better understand how they measure retention. Specific questions that we were seeking answers to included:

Use in Financial Reporting
- How many public companies report on net retention metrics?
- What do they call the metric? Net Revenue Retention? Dollar-Based Net Retention?

Formula and Calculations
- What are the formulas used for the calculations?
- What is the core "recurring revenue" metric used - ARR, ACV, or GAAP?
- What is the length of the base and comparative periods? 1 month, 1 quarter, 1 year?
- What types of smoothing or averaging are used to remove volatility from reporting?

Products included in Calculations
- Are non-recurring revenue streams included?
- Are fees from usage-based pricing products included?
- Are professional services included?
- Are any products excluded (e.g. legacy, M+A)?

Customers included in Calculations
- Are any customer segments excluded (e.g. SMB)?
- Are customers on monthly plans included?

Policies
- How are currency fluctuations accounted for?
- How are policy changes communicated to investors? Are results restated?

HOW PUBLIC SAAS COMPANIES REPORT

EXAMPLES OF STATEMENTS ABOUT THE IMPORTANCE OF RETENTION

*"We expect to derive a **significant portion of our revenue growth from expansion within our customer base**, where we have an opportunity to expand adoption of Asana across teams, departments, and organizations. We believe that our dollar-based net retention rate demonstrates our opportunity to further expand within our customer base, particularly those that generate higher levels of annual revenues."*

Asana

*"Our goal is to drive digital adoption of our software solutions, and our transaction and usage-based revenue aligns our success with our customers' success. **The more our customers and their clients accelerate digital adoption, the more our revenue increases**. Our ability to grow with our customers is best demonstrated by our dollar-based net retention rate."*

EngageSmart

*"To further illustrate **the "land and expand" economics** of our customer relationships, **we examine the rate at which our customers increase their subscriptions** for our software solutions. Our dollar-based net retention rate measures our ability to increase revenue across our existing customer base through expanded use of our software solutions, offset by customers whose subscription contracts with us are not renewed or renew at a lower amount."*

Jamf

*"Historically, **we have experienced significant expansion after initial deployment of our products by our customers**, with customers expanding usage as well as extending to additional products. A further indication of the propensity of customer relationships to expand over time is our dollar-based net retention rate, which compares ARR from the same set of customers in one period relative to the prior year period."*

HashiCorp

*"We expect to **derive a significant portion of our revenue growth from expansion within our customer base**, where we have an opportunity to expand adoption of the Work OS across teams, departments, and organizations. We believe that our dollar-based net retention rate ("Net Dollar Retention Rate") demonstrates our opportunity to further expand within our customer base, particularly those that generate higher levels of annual revenues."*

Monday.com

STUDY FIRMOGRAPHICS - DETAILS

We reviewed 135 companies that were actively listed on the NASDAQ or NYSE in calendar years 2022-23. Eight of the companies reviewed are no longer public, having exited to the private markets or acquired by a strategic buyer. We included these organizations, such as Avalara, New Relic, and Coupa, given the recent nature of their disclosures and our goal of analyzing the broadest possible set of companies.

We also reviewed a set of historical filings from 30 companies that were acquired or taken private between 2012 and 2021. These were also included to provide a richer set of examples from a broader population of companies.

Note that all of the quantitative results reported in the charts and statistics within this report are data from the 135 companies that were public in 2022-23 and do not include the 30 historical companies.

Throughout the report we include real-world examples of each type of formula and policy election in the form of excerpts from investor filing. These excerpts are taken both from the 135 public companies and the 25 historical.

Note, that the bulk of the analysis was performed on SEC 10-K and 20-F annual filings. We only reviewed a small percentage of the investor presentations, earnings announcements, or quarterly reports (10-Qs) for retention disclosures.

STUDY FIRMOGRAPHICS

Companies Analyzed
- 135 listed in 2022 or 2023
- 30 listed between 2012 and 2022
- SaaS, cloud, fintech, cybersecurity
- NYSE or NASDAQ listed
- Foreign issuers included

Fully Reviewed
- Annual SEC filings – 10-K or 20-F (filed in 2022 or 2023)
- S1 registrations (if no annual report available)

Limited Review
- Investor day presentations
- Quarterly reports – 10-Qs
- Earnings announcements

TECHNOLOGY SECTORS ANALYZED

Although the report title uses the word “SaaS,” the sample of companies reviewed are not all pure-play SaaS providers. We reviewed a broader cross-section of technology companies including some that might be better labeled as cloud, fintech, cybersecurity, marketplaces, or hybrid hardware-software providers. Our goal was to review a broader sample of retention metrics and definitions from technology businesses with recurring revenue models.

Subsector	Description	Examples
Software/Cloud Mega-Vendors	Selling a mix of consumer and business products including hardware, professional services, software and cloud services.	Alphabet Microsoft Oracle
Pre-Cloud Software Vendors	Traditional software vendors that were not born in the cloud and historically had sold perpetual licenses with maintenance contracts. All are transitoning to “as-a-Service” business models.	Appian Informatica PegaSystems
Cloud Infrastructure	Providers specializing in value-added networking services, communications-as-a-service, and cloud platform management that often have consumption-based pricing models.	Akamai Bandwidth Hashi Corp
Hardware + Software	Traditional hardware vendors with a meaningful percentage of revenue coming from software applications, including some transitioning to a software-led business model.	F5 Palo Alto Networks Cisco
FinTech	Vertical SaaS applications focused on the banking and securities trading sectors.	Blend MeridianLink Clearwater Analytics

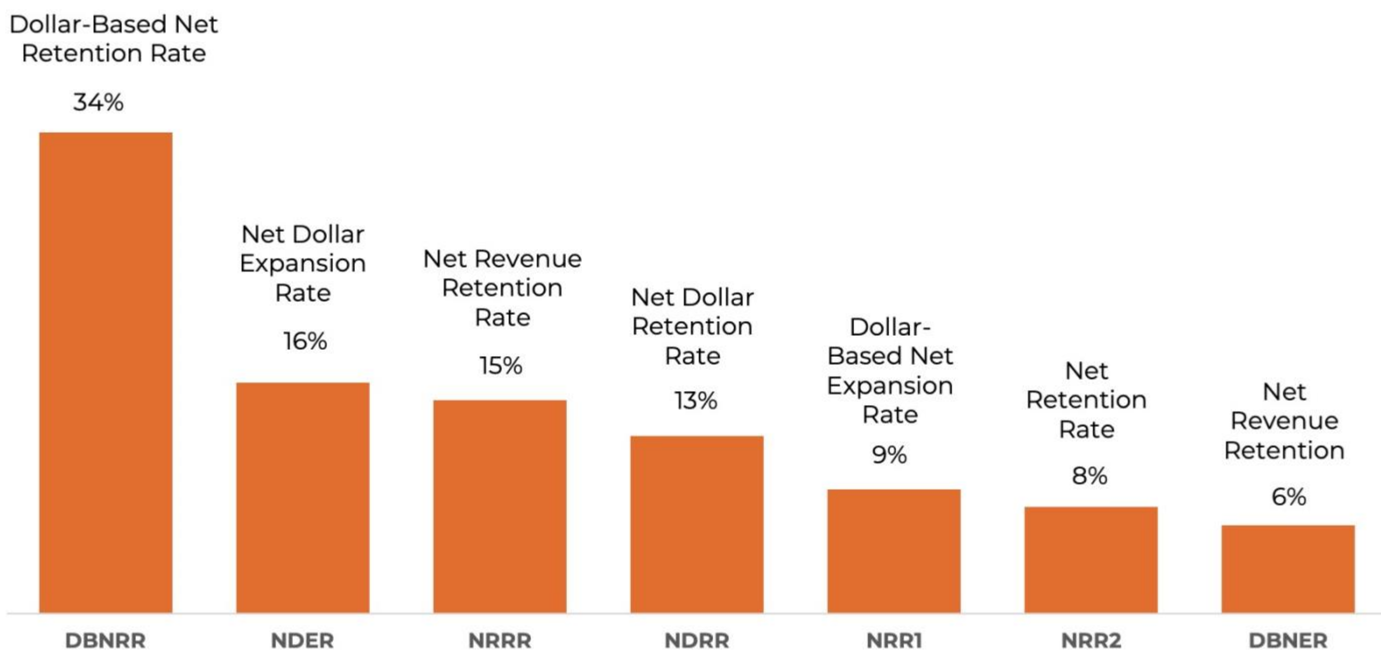
A complete list of the companies reviewed is included in the appendix with links to the respective investor relations sites.

1.3: PUBLIC COMPANY REPORTING

NAMING OF THE RETENTION METRIC

We found 30 different names used for the net retention metric amongst the 97 companies that reported on it. “Dollar-Based Net Retention Rate” was the most popular with more than double the number of references of any other term. As a result, we elected to use it in the title of this report. “Net Dollar Expansion Rate,” “Net Revenue Retention Rate,” and “Net Dollar Retention Rate” were also used by more than 10 of the companies.

Figure 2 – Terminology used for Retention Metrics



HOW PUBLIC SAAS COMPANIES REPORT

EXAMPLES OF NAMES FOR RETENTION METRICS

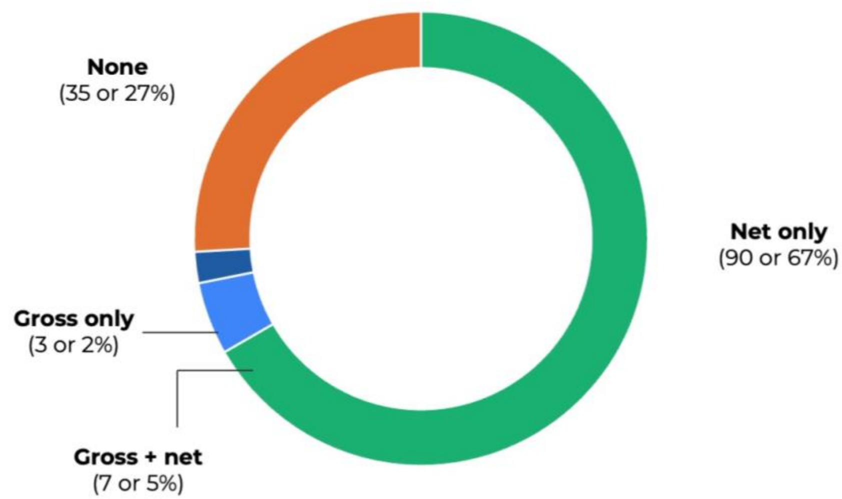
Company	Name
Amber Road*	Annualized Recurring Revenue Retention
Appian	Cloud Subscription Revenue Retention Rate
Apptio*	Net Subscription Dollar Rate
BenefitFocus*	Software Services Revenue Retention Rate
EverCommerce	Monthly Net Pro Forma Revenue Retention Rate
Fastly	Last-Twelve Months Net Retention Rate
Klaviyo	Dollar-Based Net Revenue Retention Rate
MeridianLink	ARR Net Retention Rate
MongoDB	Net ARR Expansion Rate
Paycom	Annual Revenue Retention Rate
RingCentral	Net Monthly Subscription Dollar Retention Rate
Xactly	Revenue Retention Rate
Wix	Annual Net Revenue Retention Rate
Yodlee*	Subscription Revenue Net Retention Rate

**No longer publicly traded companies. Included to provide additional examples.*

PUBLIC COMPANY REPORTING ON NET VS GROSS

- **Net Retention Only** – 90 of the 135 companies reported on one or more "net" retention metrics
- **Net + Gross Retention** – 7 companies reported on both a net and gross retention.
- **Gross Retention Only** – 3 companies reported only on a gross metric.
- **None** – 35 of the 135 companies did not reference either a net or gross retention. *

Figure 1: Retention Metrics Reported by Public Companies



The inconsistency in naming conventions for retention metrics can create confusion about what specifically is being reported by SaaS companies. We decided to ignore the name and use the company's definition when counting the number of companies reporting on gross vs net retention. We counted a metric as "net" if it included the impacts of expansion, contraction, and churn regardless of what name the SaaS company reporting it used. We considered a metric as "gross" if it only included contraction and churn for base customers.

DUAL-REPORTING ON NET RETENTION METRICS

Several companies report on two or more net retention metrics calculated using different formulas or customer cohorts to provide investors with additional visibility into their performance.

EXAMPLES OF DUAL REPORTING ON MULTIPLE METRICS

Tenable

Dollar-Based Net Expansion Rate

"Our dollar-based net expansion rate is evaluated on a last twelve months, or LTM, basis, and is calculated as follows:

• Denominator: To calculate our dollar-based net expansion rate as of the end of a reporting period, we first determine the annual recurring revenue, or ARR, from all active subscriptions (both revenue recognized ratably over the subscription term and upon delivery) and maintenance from perpetual licenses as of the last day of the same reporting period in the prior year. This represents recurring payments that we expect to receive in the next 12-month period from the cohort of customers that existed on the last day of the same reporting period in the prior year.

• Numerator: We measure the ARR for that same cohort of customers representing all subscriptions and maintenance from perpetual licenses based on customer orders as of the end of the reporting period.

We calculate dollar-based net expansion rate by dividing the numerator by the denominator."

Alternative Dollar-Based Net Expansion Rate

"We have also utilized an alternative dollar-based net expansion rate to assess our ability to expand sales with existing customers and evaluate the performance of our sales team. This alternative dollar-based net expansion rate is based on the methodology described above, but ***excludes the annual contract value of prior period multi-year sales from ARR in the numerator and the denominator of the calculation****.*

The multi-year sales excluded from ARR has generally been approximately 13% of the total ARR. This methodology measures ***net expansion by customers with contracts up for renewal during the period****. Applying this methodology would have increased the dollar-based net expansion rate by two to four percentage points at December 31, 2022, 2021 and 2020. As the difference between this alternative rate and the dollar-based net expansion rate disclosed above has not differed significantly over the last three years, we no longer include this alternative rate in our internal analysis of the business and will not disclose the impact of the alternative rate in future periods."*

Workiva

Subscription and support revenue retention rate.

"We calculate our subscription and support revenue retention rate based on all customers that were active at the end of the same calendar quarter of the prior year ("base customers"). We begin by annualizing the subscription and support revenue recorded in the same calendar quarter of the prior year for those base customers who are still active at the end of the current quarter. We divide the result by the annualized subscription and support revenue in the same quarter of the prior year for all base customers."

Subscription and support revenue retention rate including add-ons

*"**Add-on revenue includes the change in both solutions and pricing for existing customers**. We calculate our subscription and support revenue retention rate including add-ons by annualizing the subscription and support revenue recorded in the current quarter for our base customers that were active at the end of the current quarter. We divide the result by the annualized subscription and support revenue in the same quarter of the prior year for all base customers."*

COMMON THEMES IN DEFINITIONS

Most companies that reported on retention also provided an explanation of how they measured and defined it. Although the definitions varied in word choice, there was strong convergence on a few key themes across the SaaS industry. Retention metrics measure:

- **Recurring Revenue** – Measures a SaaS company's ability to retain its recurring revenue from subscriptions. Recurring revenue almost always includes products with fixed fees "subscription pricing," but could also include reoccurring charges from software maintenance, usage fees, support.
- **Comparative Period** – Recurring revenue is compared between a base period and a current period. Period could be a range of time such as a month, a quarter, a full year. Alternatively, it could be a measurement at a point in time such as end of quarter.
- **Customer Cohort** – Retention is measured for a specific group of customers that generated recurring revenue in the base period.
- **Includes** – Net retention includes the effects of expansions (upsell) and contractions (downgrades) as well as, churn from accounts that canceled altogether.
- **Excludes** – Net retention excludes the revenue from customers newly acquired during the current period that were not customers in the base period. These are often referred to as "new logo" accounts.

EXAMPLE DEFINITIONS

"We define NDR as the percentage of ARR retained from existing customers across a defined period, after accounting for upsell, down-sell, pricing changes and churn."

Definitive Healthcare

"Net Revenue Retention is a measure of the percentage of recurring revenue retained from customers over a given period of time."

Hubspot

"Our Net Retention Rate compares our subscription revenue from the same set of customers across comparable periods and reflects customer renewals, expansion, contraction and churn."

Qualtrics

SECTION 2

FORMULAS

VARIATIONS IN APPROACH TO CALCULATIONS

Numerous studies have pointed out the different formulas used to calculate net retention metrics. Perhaps the most comprehensive analysis was performed by Keybank, who in 2019 published 110 different approaches that were in use by public SaaS companies to calculate retention metrics[1].

In this research we wanted to go one step further to categorize and compare the differences between the various methodologies used in calculating retention. We identified four key differences in the approaches:

1) **Formulas** - Companies are using different mathematical formulas to calculate the metrics. For example, the most common approach is to take the recurring revenue from the current period divided by the recurring revenue from the base period.

2) **Core Metrics** - Companies are inputting a number of different recurring revenue metrics into the actual formulas. ARR and GAAP revenue are the most common, but ACV and billings are used as well.

3) **Comparative Period** – Companies are using comparative periods of different lengths. Some compare recurring revenue at a point in time such as the end of the quarter. Others use a range of time such as a fiscal year, quarter, or month.

4) **Averaging Method** – A subset of the companies are blending the current period net retention metric with historical results from the past four quarters or twelve months. The average is what is reported to investors.

In the following sections, we will explore the variations used in greater depth for each of the four categories outlined above.

1. KBCM SaaS Public Company Reporting Metrics - https://www.key.com/businesses-institutions/industry-expertise/saas-resources.html

HOW PUBLIC SAAS COMPANIES REPORT

The table below outlines the most common variables we found in each component of the retention formula. Each of the approaches outlined in the table below is explained in further detail later in the section.

Formula	Core Metric	Comparative Period	Averaging
Mathematical equation used to calculate the metric	**Recurring revenue plugged into the numerator and denominator**	**Length of time for which recurring revenue is compared**	**Blending of historical results to calculate the reported number**
Current/Base **Sum of Movements** • Base • Expansion • Contraction • Churn **Total – Churn** **Aggregate of Past Four Quarters**	**GAAP Revenue** • Trailing 12 months • Annualized **ARR/MRR** • Implied • Contracted **Other** • ACV • Billings • Invoice	**Point in Time** **Range of Time** • Full year • Full quarter • Full month	**Calculation** • Arithmetic • Weighted • Dollar Weighted **Time Period** • Trailing four quarters • Trailing twelve months

2.1 FORMULAS

APPROACH 1
SIMPLE QUOTIENT – CURRENT/BASE

The “simple quotient” model is the most popular amongst publicly traded SaaS companies, used by more than 80% of companies analyzed.

The numerator is the current period revenue for the cohort of customers. The denominator is the prior period revenue for the same cohort. Both ARR and GAAP revenue can be used in the formula. The period could be a point-in-time or a range-of-time (a full year, a full quarter, or a full month).

$$\frac{Recurring\ Revenue^{base}_{current\ period\ end}}{Recurring\ Revenue^{base}_{base\ period\ end}}$$

Revenue = GAAP or annualized GAAP
Base = customers from the base period (e.g. end of last fiscal year)

EXAMPLE OF SIMPLE QUOTIENT

We calculate our net dollar retention rate as a quotient of the following:

- *Denominator:* ***Revenue from customers*** *whose revenue existed in the twelve months ending on the day* ***twelve months prior*** *to the date as of which the retention rate is being reported.*
- *Numerator:* ***Revenue in the last twelve months*** *from the customers whose revenue is reflected in the denominator.*

Cvent

HOW PUBLIC SAAS COMPANIES REPORT

APPROACH 2
SUM OF REVENUE MOVEMENTS

The numerator starts with the Beginning ARR and then adds Expansion ARR. Next both Contraction ARR and Churn ARR are subtracted. The denominator is the beginning ARR.

$$\frac{Beginning\ ARR_{period}^{base} + Expansion\ ARR_{period}^{base} - Contraction\ ARR_{period}^{base} - \ Churn\ ARR_{period}^{base}}{Beginning\ ARR_{period}^{base}}$$

This is the most common model referenced by venture capital firms, fractional CFOs, and technology vendors (that make reporting software for retention metrics), but was only used by a handful of the publicly traded SaaS companies.

EXAMPLE OF REVENUE COMPONENTS FORMULA

“We calculate NDR as beginning ARR for a period, plus (i) expansion ARR (including, but not limited to, upsell and pricing increases), less (ii) churn (including, but not limited to, non-renewals and contractions), divided by (iii) beginning ARR for a period.”

Definitive Healthcare

“We calculate LTM NRR by dividing the total customer revenue for the prior twelve-month period (“prior 12-month period”) ending at the beginning of the last twelve-month period (“LTM period”) minus revenue contraction due to billing decreases or customer churn, plus revenue expansion due to billing increases during the LTM period from the same customers by the total prior 12-month period revenue.”

Fastly

APPROACH 3
TOTAL MINUS NEW

The numerator is the current period total revenues minus all of the new logo revenue. The denominator is the base period total revenues.

$$\frac{Revenue_{month-month-12}^{current\ year\ total} - Revenue_{month-13\ to\ month-24}^{current\ year\ new\ logos}}{Revenue_{month-month-12}^{base\ year\ total}}$$

For all customers in base year

Only a few publicly traded companies used this formula.

“We calculate our dollar-based net retention rate at the end of a given period by using (a) the revenue from all customers during the twelve months ending one year prior to such period as the denominator and (b) the revenue from all remaining customers during the twelve months ending as of the end of such period minus the revenue from all customers who are new customers during those twelve months as the numerator.”

CS Disco

APPROACH 4
AGGREGATE OF FOUR QUARTERS

The numerator is the sum of the last four quarters (current quarter, 0, through -3) revenue for the cohort of customers. The denominator is the sum of the prior four quarters (quarters -4 through -7).

$$\frac{Revenue_{quarter-3}^{base} + Revenue_{quarter-2}^{base} + Revenue_{quarter-3}^{base} + \ Revenue_{quarter}^{base}}{Revenue_{quarter-7}^{base} + Revenue_{quarter-6}^{base} + Revenue_{quarter-5}^{base} + \ Revenue_{quarter-4}^{base}}$$

Base = Customer in last quarter of prior fiscal year
Quarter = Current quarter
Revenue = GAAP revenue

Only a few publicly traded SaaS companies used this formula.

EXAMPLE OF FOUR QUARTER AGGREGATE

"We calculate our net dollar-based retention rate by starting with the revenue billed to BILL standalone customers in the last quarter of the prior fiscal year (Prior Period Revenue). We then calculate the revenue billed to these same customers in the last quarter of the current fiscal year (Current Period Revenue).

We then repeat the calculation of Prior Period Revenue and Current Period Revenue with respect to each of the preceding three quarters, and aggregate the four Prior Period Revenues (the Aggregate Prior Period Revenue) and the four Current Period Revenues (the Aggregate Current Period Revenue). Our net dollar-based retention rate equals the Aggregate Current Period Revenue divided by Aggregate Prior Period Revenue."

Bill.com

ADDITIONAL APPROACHES
COMPANY-SPECIFIC FORMULAS

A few companies defined unique formulas to best measure the unique revenue dynamics of their customer base.

EXAMPLES OF COMPANY-SPECIFIC FORMULAS

“We define our Net Monthly Subscription Dollar Retention Rate as (i) one plus (ii) the quotient of Dollar Net Change divided by Average Monthly Recurring Subscriptions.

We define Dollar Net Change as the quotient of (i) the difference of our Monthly Recurring Subscriptions at the end of a period minus our Monthly Recurring Subscriptions at the beginning of a period minus our Monthly Recurring Subscriptions at the end of the period from new customers we added during the period, all divided by (ii) the number of months in the period. We define our Average Monthly Recurring Subscriptions as the average of the Monthly Recurring Subscriptions at the beginning and end of the measurement period.

For example, if our Monthly Recurring Subscriptions were $118 at the end of a quarterly period and $100 at the beginning of the period, and $20 at the end of the period from new customers we added during the period, then the Dollar Net Change would be equal to ($0.67), or the amount equal to the difference of $118 minus $100 minus $20, all divided by three months.”

RingCentral

“We calculate our monthly net pro forma revenue retention rate for a particular month as the recurring or re-occurring revenue gained/lost from existing customers, less the recurring or re-occurring revenue lost from cancelled customers, as a percentage of total recurring or re-occurring revenue 12 months prior, divided by 12.”

EverCommerce

HOW PUBLIC SAAS COMPANIES REPORT

"We now calculate annual revenue retention rate for any 12-month period (a "Measurement Period") as follows: The trailing 12-month value of revenue from clients lost during the Measurement Period ("TTM Revenue Attrition") is equal to the actual recurring fees paid by such lost clients during the 12 months preceding the respective dates on which they last processed payroll with us."

$$\frac{\text{Total Revenues – Interest Earned on Funds Held for Clients – TTM Revenue Attrition}}{\text{Total Revenues – Interest Earned on Funds Held for Clients}}$$

Paycom

"To calculate our annually dollar-based net expansion rate, we first establish the base period monthly recurring revenue from all our customers at the end of a month. This represents the revenue we would contractually expect to receive from those customers over the following month, without any increase or reduction in any of their subscriptions. We then (i) calculate the actual monthly recurring revenue from those same customers at the end of that following month; then (ii) divide that following month's recurring revenue by the base month's recurring revenue to arrive at our monthly net expansion rate; then (iii) calculate a quarterly net expansion rate by compounding the net expansion rates of the three months in the quarter; and then (iv) calculate our annualized net expansion rate by compounding our quarterly net expansion rate over an annual period."

New Relic
(Historical - 2014)

2.2 CORE METRICS FOR RETENTION

In the previous section, we discussed the various formulas used to calculate retention metrics. In each of the formulas, the changes in recurring revenue were measured between the base period and the current period. However, one thing you may have noticed is that the type of "recurring revenue" being measured varied in some of the formulas. Some companies were using annual recurring revenue (ARR) while others were using the trailing twelve months of GAAP revenue.

The "core" recurring revenue metric used in the formula is another area where SaaS companies diverge in the definition, measurement, and reporting of dollar-based net retention rates.

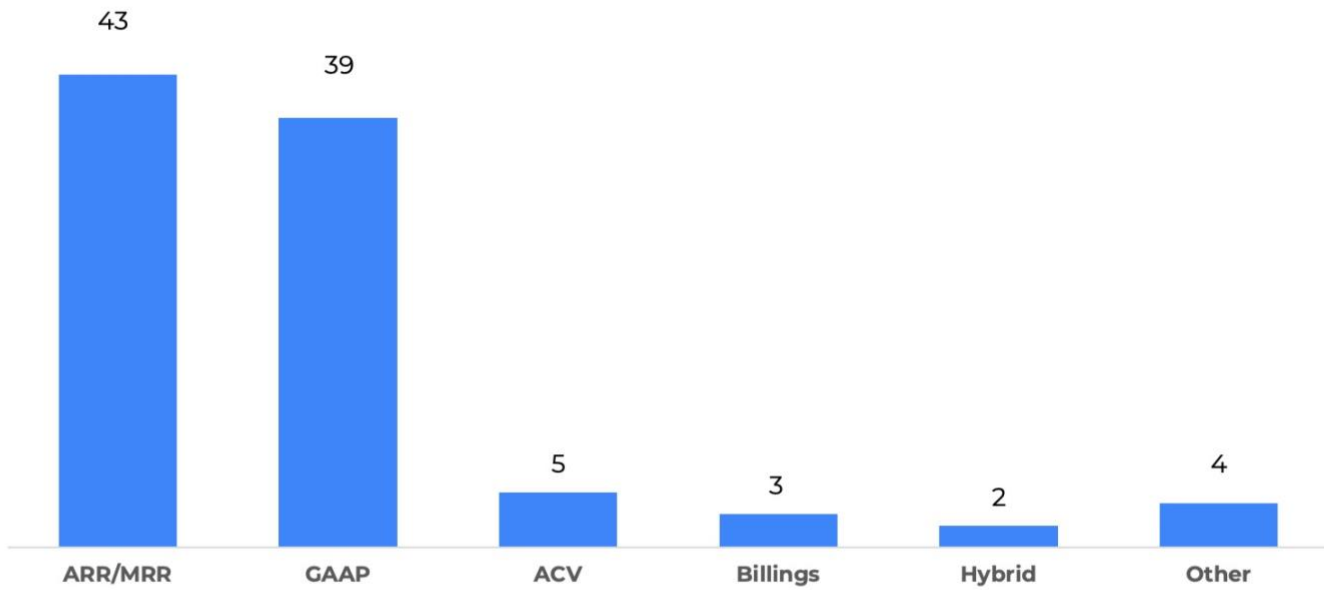
SaaS companies use a wide variety of these recurring revenue metrics in their retention calculations, including:

- ARR – Annual Recurring Revenue
- GAAP Revenue – Under ASC 606 or IFRS 15
- Annualized GAAP Revenue
- ACV – Annual Contract Value
- Billings
- Net Invoicing
- Contractual Monthly Subscription Revenue
- Implied Monthly Subscription and Support Revenue
- Adjusted Monthly Revenue

THE MOST COMMON RECURRING REVENUE METRICS USED

ARR and GAAP revenue are the most common core metric, used by 82 of the 97 companies that reported on net retention metric. A handful of SaaS providers use contract value or annualized contract value (ACV) as well as billings to measure retention.

Figure N – Core Metric used in Retention Calculation



On the following pages, we will provide examples of each of these core metrics and how SaaS companies define them.

METRIC 1
ARR – ANNUAL RECURRING REVENUE

The most common recurring revenue metric used is annual recurring revenue. (ARR). Of the 92 public companies reporting on retention, 40 used ARR. Only one, Toast, used monthly recurring revenue (MRR).

A handful of public companies use only a segment of ARR from selected product lines, customer segments, or revenue profiles in their calculations. For example, Zoom uses only ARR from enterprise accounts.

Another noteworthy set of companies is those in the process of transitioning from a traditional "on-premise" and perpetual license model to a cloud-centric and "as-a-service" model. Some of these organizations only track retention for the newer "as-a-service" customer base. For example, Informatica reports on "Subscription NRR." Splunk uses "Cloud DBNRR." However, others, such as Tenable, include both the "as-a-service" revenue and the recurring stream of maintenance payments from perpetual licenses.

We will explore these "segment reporting" models for retention in greater depth in a later section of the report.

EXAMPLES OF CALCULATIONS USING ARR

*"We calculate Cloud DBNRR by dividing the **Cloud ARR** at the end of a period ("Cloud Current Period ARR") by the Cloud ARR of the same group of customers at the beginning of that 12-month period."*

Splunk

"Subscription NRR compares the contract value for Subscription ARR from the same set of customers at the end of a period compared to the prior year."

Informatica

*"To calculate our dollar-based net expansion rate as of the end of a reporting period, we first determine the annual recurring revenue, or ARR, from all **active subscriptions** (both revenue recognized ratably over the subscription term and upon delivery) **and maintenance from perpetual licenses** as of the last day of the same reporting period in the prior year.*

Tenable

METRIC 2
GAAP REVENUE

Historical GAAP revenue is the second most popular core metric. It was used by 37 of the 92 companies that report on a net retention metric. In this case, GAAP revenue refers to the traditional revenue line item on the income statement as defined under ASC 606 or IFRS 15 (versus ARR, MRR, and other non-GAAP metrics).

A common policy election we observed was to use only a subset of GAAP revenues that represent the recurring revenues. For example, Sprinklr reports on "subscription revenue." Appian calculates its net retention metric using "recurring cloud subscription revenue." Autodesk used "recurring revenue." Olo used only "platform" revenue. Snowflake used only "product" revenue which excludes professional services.

EXAMPLES OF CALCULATIONS USING GAAP REVENUE

"Cloud subscription revenue retention rate is then calculated by dividing the aggregate recurring cloud subscription revenue in the current trailing 12-month period by the previous trailing 12-month period."

Appian

"We calculate NDE by dividing (i) ***subscription revenue*** *in the trailing 12-month period from those customers who were on our platform during the most recent prior 12-month period by (ii) subscription revenue from the same customers in the preceding prior 12-month period."*

Sprinklr

METRIC 3
ANNUALIZED GAAP

There were a number of variations on how GAAP revenue was used in the calculation. Most companies used historical GAAP reported in the quarter for the numerator and denominator in the equation. However, others, such as Cloudflare and Workiva, use annualized GAAP, which is a forward-looking projection calculated by multiplying the current quarterly revenue by four (or monthly revenue times twelve).

EXAMPLES OF CALCULATIONS USING ANNUALIZED GAAP

*"We begin by **annualizing the subscription and support revenue** recorded in the same calendar quarter of the prior year for those base customers who are still active at the end of the current quarter."*

Workiva

*"To calculate dollar-based net retention for a quarter, we compare the **Annualized Revenue from paying customers four quarters** prior to the Annualized Revenue from the same set of customers in the most recent quarter."*

Cloudflare

METRIC 4
ACV – ANNUAL CONTRACT VALUE

Five of the 92 public companies used ACV or annual contract value in their calculations. nCino, which boasts one of the highest rates in the SaaS industry, reported on multiple net retention metrics – one that used GAAP revenue and another that is based on ACV. Clearwater Analytics used ACV for its gross retention metric, but ARR for its net retention calculations.

EXAMPLES OF CALCULATIONS USING ACV

Net Revenue Retention

"Net revenue retention is a metric that we calculate based on customers of ZoomInfo at the beginning of the twelve-month period, and is calculated as: (a) the **total annual contract value ("ACV")** *for those customers at the end of the end of the twelve-month period, divided by (b) the total ACV for those customers at the beginning of the twelve-month period."*

ZoomInfo

ACV-based Net Retention

"To measure net retention, we categorize customers by the year in which they first contracted for one of our solutions, which we call an annual cohort. For each annual cohort, we measure the **total ACV** *for our most recently completed fiscal year and divide it by the total ACV for such cohort at the end of the initial cohort year. We refer to the resulting quotient as "ACV-based net retention."*

nCino

METRIC 5
BILLINGS

A handful of the public SaaS companies we analyzed calculate their retention metrics using billings instead of ARR, ACV, or GAAP revenue. The use of billings varies amongst SaaS providers with their specific policy elections.

In some cases, the "total billings" are used which could include all the products for which the SaaS company invoices its customers. Total billings can include a mix of recurring and non-recurring revenues – subscription fees, hardware, payments revenue, professional services, and one-time fees. In other cases, only the billings associated with specific types of recurring revenues such as subscriptions are used in the retention formula.

EXAMPLES OF BILLINGS USED IN RETENTION FORMULAS

*"Billings include **billings of subscriptions fees and billings of fees from our payments solutions** in respect of which we act as the principal in the arrangement with the customer. We then divide the Billings for the Base Customers in the same month of the subsequent year, or the "Comparison Month", by the Billings in the Base Month to derive a monthly NRR."*

Lightspeed

*"We calculate our net dollar-based retention rate by starting with the **revenue billed** to BILL standalone customers in the last quarter of the prior fiscal year (Prior Period Revenue). We then calculate the revenue billed to these same customers in the last quarter of the current fiscal year (Current Period Revenue)."*

Bill.com

*"The **total billings** and allocated partner revenue, where applicable, for the measured period are divided by the total billings and allocated partner revenue for such accounts, corresponding to the period one year prior."*

BigCommerce

HOW PUBLIC SAAS COMPANIES REPORT

Also noteworthy that several other public SaaS companies had historically used billings as the core metric for retention calculations.

EXAMPLES OF HISTORICAL USE OF BILLINGS

"To calculate dollar-based net retention for a period, we compare the Annualized Billings from paid customers 12 months prior to the ***Annualized Billings*** *from the same set of customers in the last month of the current period. Our dollar-based net retention includes any expansion and is net of contraction and attrition, but excludes Annualized Billings from new customers in the current period."*

Cloudflare – Historical 2019

"Monthly Billings Retention Rate, or MBRR, is calculated as of the end of each month by considering the cohort of merchants on the Shopify platform as of the beginning of the month and dividing ***total billings*** *attributable to this cohort in the then-current month by total billings attributable to this cohort in the immediately preceding month.* ***Billings includes billings from subscriptions, apps (net of referral fees), transaction fees and fees for Shopify Payments****. For annual and quarterly fiscal periods, we report the average MBRR over the preceding 12 months."*

Shopify – Historical 2015

OTHER CORE METRICS FOR RECURRING REVENUE

CONTRACTUAL MONTHLY SUBSCRIPTION REVENUE

“Our Net Revenue Retention for a given period is calculated by first dividing Retained Subscription Revenue by Retention Base Revenue in the given period, calculating the weighted average of these rates using the Retention Base Revenue for the period, and then annualizing the resulting rates. A definition of each of the key terms used to calculate Net Revenue Retention is included below.

Retained Subscription Revenue. Contractual Monthly Subscription Revenue of the same cohort of Customers as those that comprise the Retention Base Revenue at the end of the same month.

Retention Base Revenue. Contractual Monthly Subscription Revenue of our Customers as of the beginning of each month.

***Contractual Monthly Subscription Revenue**. The subscription fees contractually committed to be paid for a full month under our Customer agreements, converted into USD at fixed rates that are held consistent over time, excluding commissions owed to our Solutions Partners.”*

Hubspot

TOTAL CONTRACTUAL MONTHLY SUBSCRIPTION REVENUE

*“We compare the aggregate subscription fees contractually committed for a full month under all customer agreements (the “**Total Contractual Monthly Subscription Revenue**”) of our total customer base (excluding OEM partners with revenue share agreements) as of the beginning of each month to the Total Contractual Monthly Subscription Revenue of the same group at the end of the month.”*

Docebo

*“We compare the aggregate subscription fees contractually committed for a full month under all customer agreements (the “**Total Contractual Monthly Subscription Revenue**”) of our total customer base (excluding OEM partners with revenue share agreements) as of the beginning of each month to the Total Contractual Monthly Subscription Revenue of the same group at the end of the month.”*

DoubleVerify

NET INVOICING

"Our Annual Dollar-Based Retention Rate is calculated by dividing our ***Retained Net Invoicing*** *by our Retention Base Net Invoicing on a monthly basis, which we then average using the rates for the trailing twelve months for the period being presented. We define Retention Base Net Invoicing as recurring net invoicing from all clients in the comparable prior year period, and we define Retained Net Invoicing as recurring net invoicing from that same group of clients in the current period. We define* ***recurring net invoicing as subscription and related usage revenue, excluding the impact of service credits, reserves, and deferrals****. Historically, the difference between recurring net invoicing and our subscription and related usage revenue has been within 10%."*

Five9
Prior Methodology

IMPLIED MONTHLY SUBSCRIPTION AND SUPPORT REVENUE

"We calculate dollar-based net revenue retention rate as the ***implied monthly subscription and support revenue*** *at the end of a period for the base set of customers from which we generated subscription revenue in the year prior to the calculation, divided by the implied monthly subscription and support revenue one year prior to the date of calculation for that same customer base.*

We define implied monthly subscription and support revenue as the total amount of minimum subscription and support revenue contractually committed to, under each of our customer agreements over the entire term of the agreement, divided by the number of months in the term of the agreement."

Blackline

ADJUSTED MONTHLY REVENUE

"We believe our dollar-based net retention rate, or NRR, provides insight into our ability to retain and grow revenue from our customer locations, as well as their potential long-term value to us. For retention rate calculations, we use ***adjusted monthly revenue, or AMR****, which is calculated for each location as the sum of (i) the subscription component of revenue for each month and (ii) the average of the trailing-three-month recurring payments revenue. Since payments revenue represents the revenue we recognize on payment processing volume, which is reported net of transaction processing fees, we believe the three-month average appropriately adjusts for short-term fluctuations in transaction volume."*

Weave

NON-DOLLAR BASED METRICS

All of the current publicly traded SaaS companies we analyzed used a dollar-based approach to the retention calculation. An alternative approach to retention metrics is to use customer count. Many of the B2C SaaS companies use subscribers or customers as the core metric for retention.

EXAMPLE – CUSTOMER COUNT USED AS CORE METRIC

"We define member retention rate as the percentage of members on the last day of the prior year who remain members on the last day of the current year, or for quarterly presentations, the percentage of members on the last day of the comparable quarterly period in the prior year who remain members on the last day of the current quarterly period."

LifeLock

We did not find any of the current publicly traded companies using customer counts. However, historically there are several examples using non-dollar based approaches such as the number of users or the number of assets under management.

EXAMPLES – NON-DOLLAR BASED METRICS USED FOR RETENTION

*"We calculate our renewal rate by comparing **the number of paid seats** of all of our existing customers at the beginning of a twelve-month period to the number of paid seats for those same customers at the end of such period, taking into account non-renewals, upgrades and downgrades. We exclude seats sold to new customers."*

Rally Software

*"We calculate our net churn for a period by dividing (i) the **number of vehicles under subscription** added from existing customers less vehicles under subscription lost from existing customers over that period by (ii) the total vehicles under subscription at the beginning of that period."*

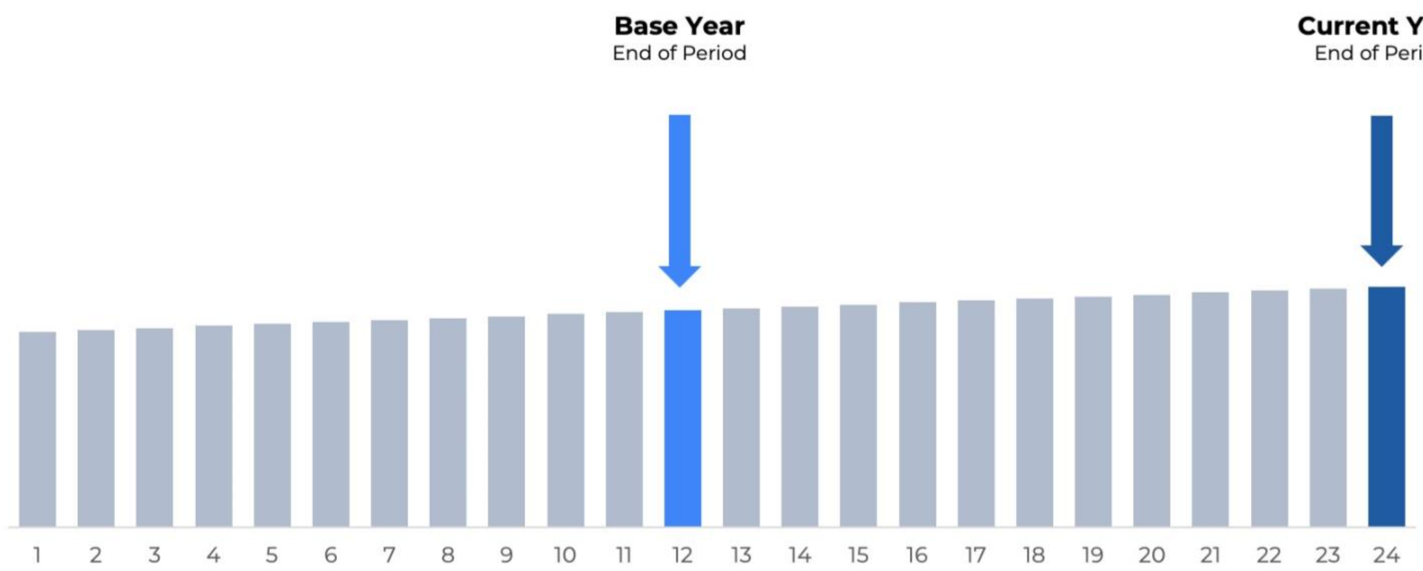
Fleetmatics

2.3: COMPARATIVE PERIOD LENGTH

CORRESPONDING POINT IN TIME

One of the biggest variations we found in how net retention metrics are calculated is the comparative period used for the analysis. Some companies compare revenue at a “point in time” for the current year to the corresponding “point in time” for the base year. For example, a SaaS company might compare ARR at the end of the current year (December 31, 2023) to the ARR at the end of the base year (December 31, 2022).

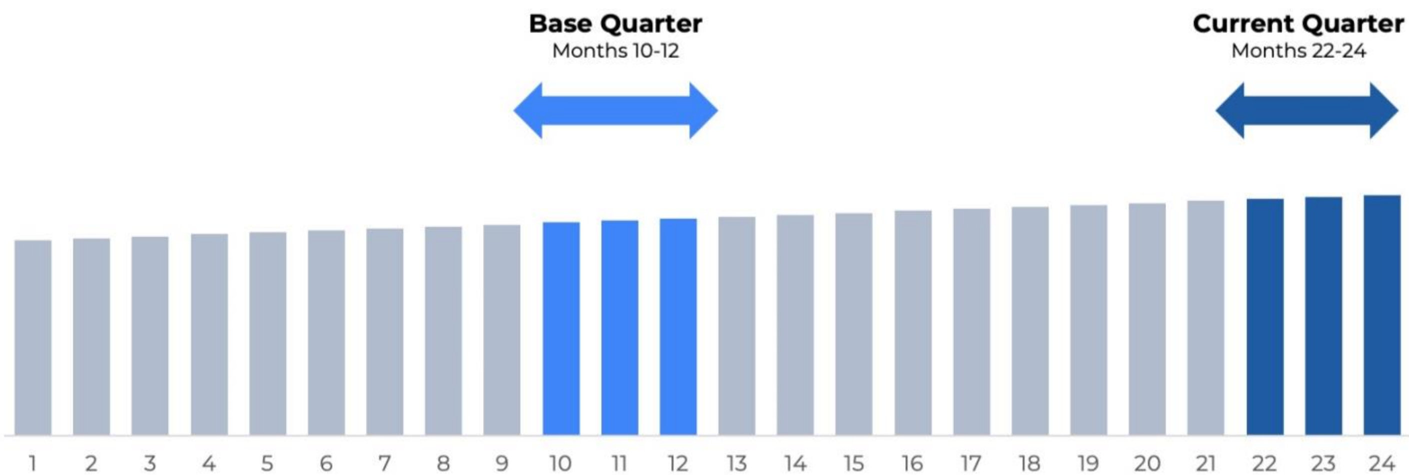
Figure N – Corresponding Point in Time as Comparative Period



CORRESPONDING PERIOD

However, other SaaS companies might calculate their net retention metric using a “range of time” representing one or more full fiscal period(s). For example, a SaaS company might compare the GAAP revenues generated in the fourth quarter of the current year (October 1 – December 31, 2023) to the GAAP revenue in the corresponding quarter in the base year (October 1 – December 31, 2022).

Figure N – Corresponding Quarters as Comparative Period



HOW PUBLIC SAAS COMPANIES REPORT

Below are two examples of disclosures from SaaS companies that compare the "corresponding" quarters or months in the current year and base year to calculate their net retention metric.

CORRESPONDING QUARTER

"Net revenue retention rate is calculated by dividing the ***current quarter*** *Recurring Revenue related to base customers by the total* ***corresponding quarter*** *Recurring Revenue from one year ago."*

Autodesk

CORRESPONDING MONTH

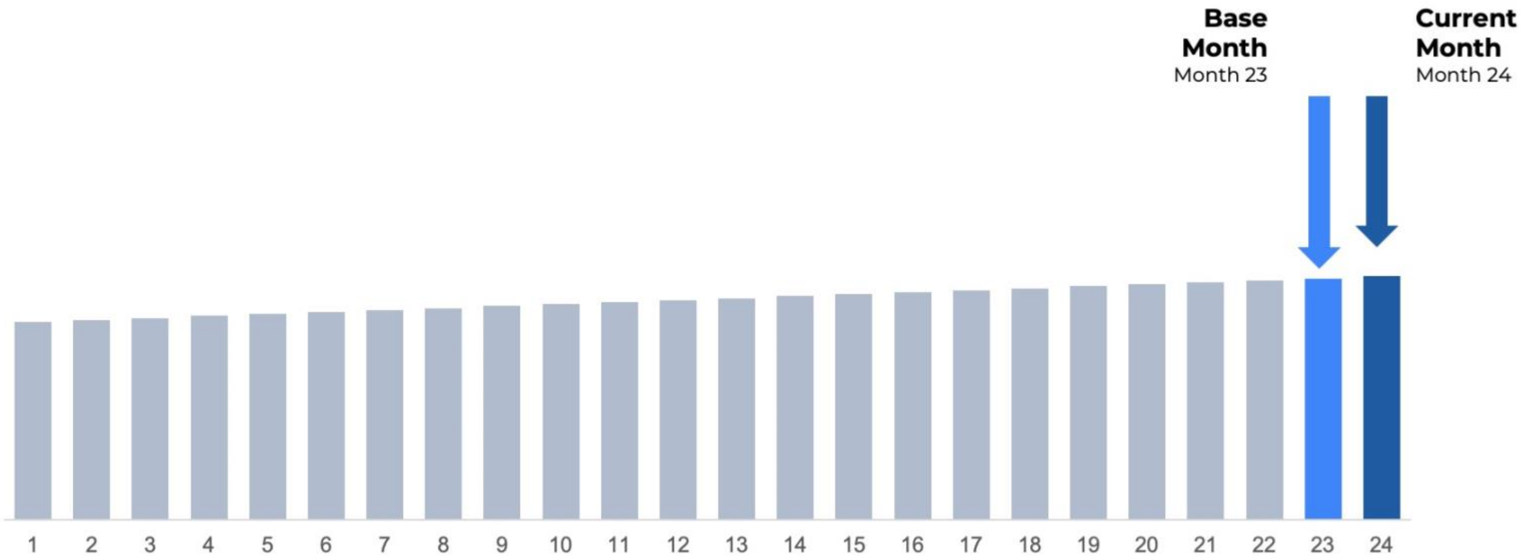
"We calculate net dollar retention rate monthly by starting with the revenue from the cohort of all customers during the ***corresponding month*** *12 months prior, or the Prior Period Revenue. We then calculate the revenue from these same customers as of the current month, or the Current Period Revenue, including any expansion and net of any contraction or attrition from these customers over the last 12 months."*

Digital Ocean

CONSECUTIVE PERIODS

We also found examples of companies that compared consecutive (versus corresponding) fiscal periods. For example, a SaaS company might compare the "subscription ARR" in the prior month (November 2023) to the "subscription ARR" in the current month (December 2023).

Figure N – Consecutive Months as Comparative Period



HOW PUBLIC SAAS COMPANIES REPORT

Below are two examples that compare "consecutive" months or years to calculate their net retention metric.

CONSECUTIVE MONTH

"We compare the aggregate Contractual Monthly Subscription Revenue of our customer base ***as of the beginning of each month****, which we refer to as Retention Base Revenue, to the aggregate Contractual Monthly Subscription Revenue of the same group of customers at the* ***end of that month****, which we refer to as Retained Subscription Revenue... Our Subscription Dollar Retention Rate for a given period is calculated by first dividing Retained Subscription Revenue by Retention Base Revenue for each month in the period, calculating the weighted average of these rates using the Retention Base Revenue for each month in the period, and then annualizing the resulting rates."*

Hubspot – Historical 2014

"In previous fiscal years, we have disclosed a net dollar retention rate which was calculated as of the ***end of each month*** *by considering the cohort of customers on our commerce platforms as of the* ***beginning of the month*** *and dividing our subscription and transaction-based revenues attributable to this cohort in the then-current month by total subscription and transaction-based revenue attributable to this cohort in the immediately preceding month. Net Retention Rate is a different measure than net dollar retention rate."*

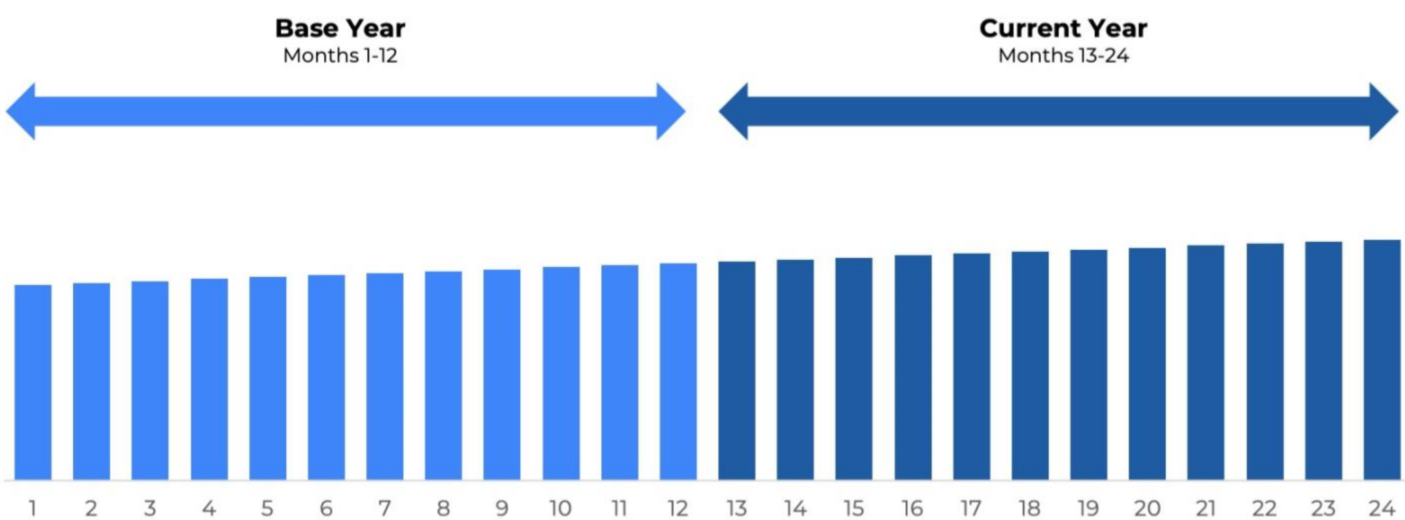
Lightspeed Commerce

CONSECUTIVE YEAR

*"We calculate our dollar-based net revenue retention rate as of the end of a period by using (a) the **revenue from our customers during the twelve month period ending one year** prior to such period as the denominator and (b) the revenue from those same customers during the twelve months ending as of the end of such period as the numerator."*

SEMRush

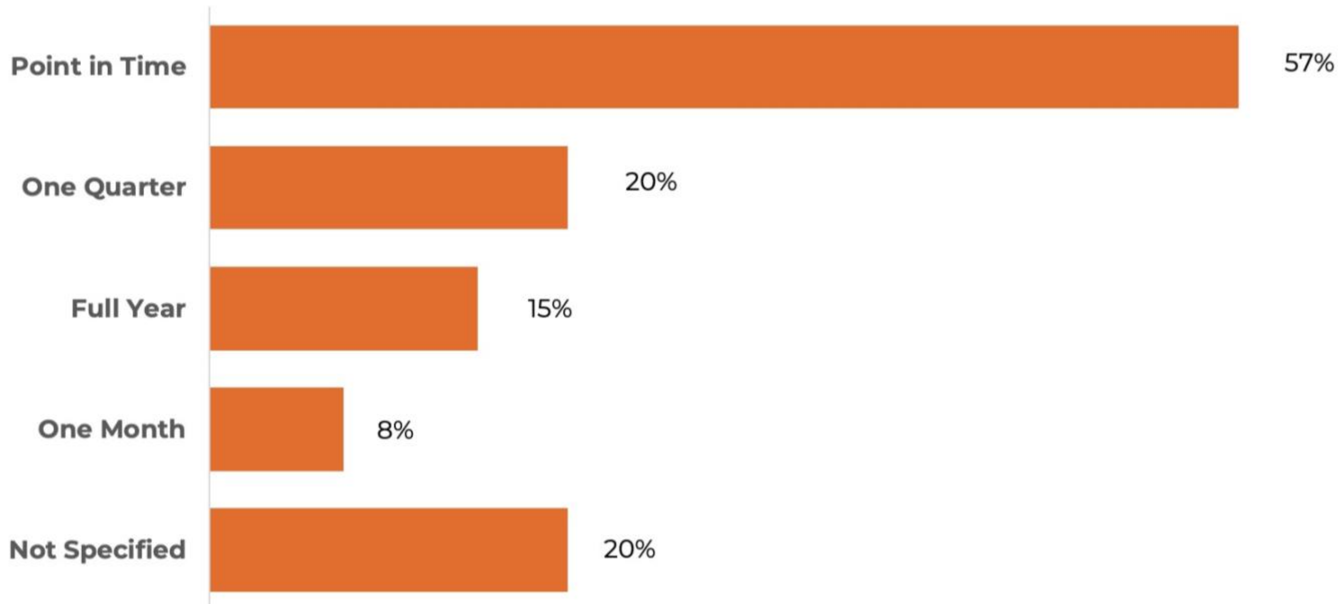
Figure N – Consecutive Years as Comparative Period



SUMMARY

In summary, the current and base periods could be a range of time (e.g., year, quarter, month) or a point in time (e.g. end of period). The comparison could be made between corresponding periods (e.g. Q4 2022 to Q4 2023) or between consecutive periods (e.g. Q4 to Q3 of 2023).

Figure 4 – Comparative Period used for Retention Reporting



2.4: SMOOTHING TECHNIQUES

Approximately one quarter (28 of the 97) companies used an averaging methodology to smooth out volatility in their retention reporting.

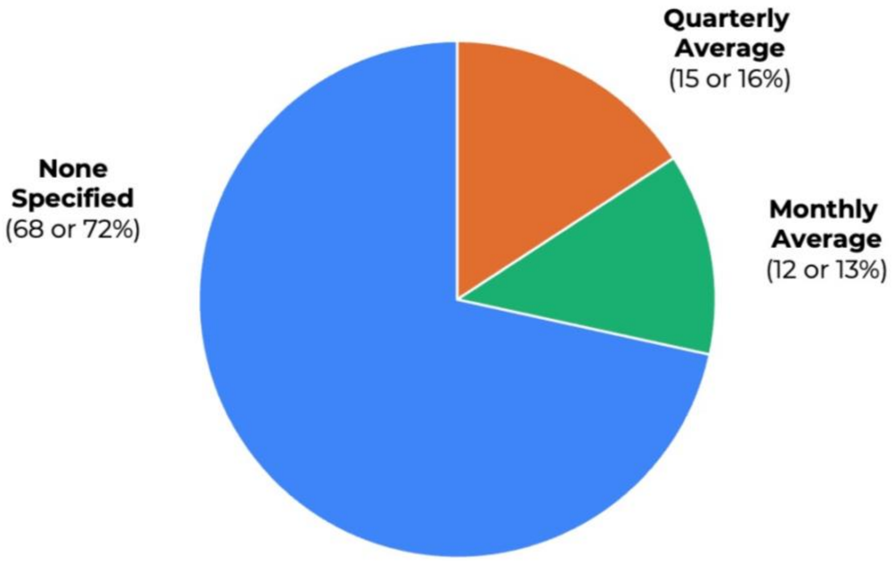
AVERAGE METHODOLOGY

55% of those using a smoothing technique used a simple arithmetic average. The remaining 45% used a more sophisticated weighted average or dollar-weighted average approach to arrive at the reported retention rate.

NUMBER OF PERIODS USED IN AVERAGE

Some calculated the averages using four quarters, while others took an average over 12 months.

Figure 5 – Average used in Retention Metrics



HOW PUBLIC SAAS COMPANIES REPORT

EXAMPLES OF ARITHMETIC AVERAGE

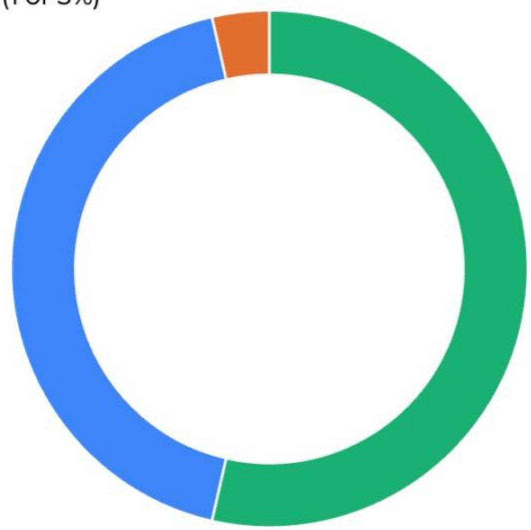
*"Our reported dollar-based net retention rate equals the simple **arithmetic average** of our quarterly dollar-based net retention rate for the **four quarters** ending with the most recent fiscal quarter."*

Asana

*"Our Annual Dollar-Based Retention Rate is calculated by dividing our Retained Net Revenue by our Retention Base Net Revenue on a monthly basis, which we then **average** using the rates for the **trailing twelve months** for the period presented."*

Five9

Figure 6 – Types of Averages Used in Retention



EXAMPLES OF DOLLAR-WEIGHTED AVERAGE

*"For the trailing 12-month Cloud DBNRR, we take the **dollar-weighted average** of the Cloud DBNRR over the trailing 12 months."*

Splunk

HOW PUBLIC SAAS COMPANIES REPORT

EXAMPLES OF WEIGHTED AVERAGE

*"For the trailing 12-month calculation, we take a **weighted average** of this calculation of our quarterly Net Dollar Retention Rate for the **four quarters** ending with the most recent quarter."*

Monday.com

*"We then calculate the **weighted average** point-in-time NRR as of the last day of each month in the **current trailing twelve-month period** to arrive at the NRR, with the weightings determined by the total ARR at the end of each period."*

Klaviyo

SECTION 3

REVENUE STREAMS

PRICING MODELS, PRODUCT LINES, AND REVENUE STREAMS

SaaS companies have different policies about which types of product lines and revenue streams are included in retention metric calculations. These policy elections have a direct impact on the net retention rate metrics. For example, if a company excludes a product line with a higher churn rate, it will have a positive upward impact on retention. If a company includes a non-recurring revenue stream, such as implementation fees, that tends to grow in correlation with bookings as the business expands, it could have a positive lift on retention figures.

In this section of the report, we will explore the various types of product lines and revenue streams that SaaS companies elect to include or exclude. We will also share examples of the associated investor disclosures explaining the elections.

Pricing Models	Professional Services	Legacy and Excluded Products	Deployment & Licensing Models
Recurring Fees • Subscription • Usage • Percentage **One-Time Fees** • Implementation/Setup • Support	**Professional Services** • Short-term engagements • Retainer model **Other Services** • Managed services • Premium customer support	**Legacy Products** • End-of-life • Products with non-recurring fees **Mergers + Acquisitions** • Recently acquired products	**Cloud** • As-a-Service • Self-Managed **Legacy On-Premise** • Perpetual licenses • Maintenance contracts • Term licenses

3.1: PRICING MODELS

THREE TYPES OF PRICING

Various pricing models are used within the SaaS industry. Some models are based on fixed monthly fees (subscription pricing), while others have variable fees (usage and percentage). A growing number of providers are using a combination of all three pricing strategies to maximize revenue.

The table below includes examples of each of the three pricing strategies.

MODEL	DESCRIPTION	EXAMPLE
Subscription Pricing	Fixed fee for contract lifecycle. Adjusted only if customer upgrades/downgrades.	Tier A = \$50 per user/month Tier B = \$100 per user/month Tier C = \$200 per user/month
Usage-Based Pricing	Variable fee based upon customer's actual consumption of service.	\$0.25 per hour \$0.50 per GB \$0.75 per transaction
Percentage Pricing	Variable fee based on a percentage of the dollar value of transactions processed.	0.1% of GMV 0.2% of referred business 0.3% of order value
Hybrid Models	Combination of fixed fee subscriptions, usage-based pricing, and percentage pricing	\$100 per month *plus* \$0.50 per unit *plus* 0.1% of transaction value

HOW PUBLIC SAAS COMPANIES REPORT

SUBSCRIPTION PRICING

The majority of SaaS and cloud providers use what is known as the "subscription pricing" model. The customer pays a fixed fee each month for the use of the software. The fee doesn't change unless the customer elects to upgrade (or downgrade) or the SaaS provider raises prices. Most customers enter into an annual or multi-year contract, which provides a predictable, contractually guaranteed stream of recurring revenue to the SaaS provider over the duration of the contract term.

USAGE-BASED PRICING

In recent years, usage-based pricing has become popular as a strategy to acquire new accounts. The monthly price is determined by how much of the product was consumed by the customer. For example, cloud infrastructure providers might charge based on the volume of data transferred into their platform or the minutes the service was used.

Customers with usage-based pricing generate revenue streams that vary each month and are only known in arrears.

PERCENTAGE PRICING

Percentage pricing is a third model. The SaaS provider charges a percentage of the dollar value of transactions processed on the platform as a fee. The "take rate" is usually in the low single digits (e.g. 1-3%). For example, an ecommerce platform might charge merchants 2% of the gross merchandise value (GMV) processed each month. Percentage pricing is popular not only in e-commerce, but in payment processing and financial services applications as well.

NET RETENTION FOR USAGE-BASED PRICING

The big question for SaaS finance teams calculating retention metrics is which types of pricing models should be included in the calculations. The purpose of net retention metrics is to measure the growth of recurring revenue from a cohort of customers. Usage fees can go up and down depending on the customer's actual consumption of the product. Are the types of variable fees generated by usage-based (and percentage) pricing considered to be recurring revenue?

SaaS companies with high levels of volatility in usage fees may want to exclude these revenue streams from retention calculations as they will likely cause the metrics to go up and down inconsistently. However, other companies with less volatile consumption patterns that are growing consistently month-over-month may want to include them in the calculations.

HOW PUBLIC SAAS COMPANIES REPORT

Our analysis of the 135 publicly traded companies found that most SaaS companies with usage or percentage pricing do include these variable fees in net retention rate calculations.

At healthy, high-performing SaaS companies with usage-based pricing models, volatility in consumption is less of a concern. A subset of individual customers dramatically may scale their usage up and down monthly. However, the majority of customers will have relatively consistent usage that is trending upward over time. Larger customers who commit to using a SaaS product with usage-based pricing will usually enter into an annual contract to obtain a discount. These annual contracts require the customer to commit to a more consistent, predictable consumption pattern to gain savings. High-performing SaaS companies with usage-based pricing obtain over 80% of revenues from customers on annual contracts. As a result, in aggregate across the customer base, the revenue is recurring and growing.

CONTRACTUALLY COMMITTED USAGE-BASED PRICING

Most SaaS and cloud providers with usage-based and transaction pricing try to get as many customers as possible to enter into annual or multi-year contracts. Longer-term contracts provide more predictability to future revenue streams. For example, a popular model is to offer the customer a 20-40% discount in exchange for a commitment to a monthly minimum quantity of usage. Based on historical consumption patterns, a customer may be comfortable agreeing to $500/month in committed fees (equivalent to 10,000 API calls). However, most SaaS and cloud providers will also add overage fees on top of the monthly minimum. For example, if the customer makes 12,000 API calls in a given month, they may be required to $600 for that month. As a result, the amount of revenue generated from these types of monthly minimum contracts with overage fees does vary month-over-month.

HOW PUBLIC SAAS COMPANIES REPORT

EXAMPLES OF USAGE-BASED FEES INCLUDED

The revenue streams included in net retention calculations are often based on ARR and therefore linked to the scope of pricing models included in ARR calculations.

Dollar-Based Net Retention Rate

"We calculate dollar-based net retention rate as of a period end by starting with the ARR from the cohort of all customers as of 12 months prior to such period-end, or the Prior Period ARR…"

ARR

"We calculate ARR by taking the monthly run-rate revenue, or MRR, and multiplying it by 12. MRR for each month is calculated by aggregating, for all customers during that month, monthly revenue from ***committed contractual amounts, additional usage, usage from subscriptions*** *for a committed contractual amount of usage that is delivered as used and monthly subscriptions."*

DataDog

Net ARR Expansion Rate

"We calculate net ARR expansion rate by dividing the ARR at the close of a given period (the "measurement period"), from customers who were also customers at the close of the same period in the prior year (the "base period"), by the ARR from all customers at the close of the base period, including those who churned or reduced their subscriptions."

ARR

"ARR includes the revenue we expect to receive from our customers over the following 12 months based on contractual commitments and, in the case of Direct Sales Customers of MongoDB Atlas, by annualizing the prior 90 days of their ***actual usage*** *of MongoDB Atlas, assuming no increases or reductions in their subscriptions or usage."*

MongoDB

EXAMPLES OF USAGE-BASED FEES EXCLUDED

"We ***exclude*** *from our calculation of ARR any revenues derived from month-to-month agreements and/or* ***product usage overage billings, where customers are billed in arrears based on product usage****."*

Dynatrace

3.2: PROFESSIONAL SERVICES

ONE-TIME AND SHORT-TERM ENGAGEMENTS

Many SaaS and cloud providers offer professional services engagements to customers to enable them to better realize the value of their software. In most cases, these services are provided on a one-time basis for a fixed duration. Examples include helping with the upfront implementation, supporting a major version upgrade, or consolidating multiple accounts following a merger or acquisition.

The majority of SaaS and cloud providers do not consider revenue from these types of one-time professional services engagements to be recurring in nature. Professional services revenue often not included in ARR, recurring GAAP revenue, or the associated net retention metric calculations.

EXAMPLES EXCLUDING PROFESSIONAL SERVICES

"Our calculation includes only subscription fee revenues and ***excludes any professional services revenues*** *and other revenues."*

MeridianLink

"The dollar-based net expansion rate excludes contract value relating to professional services from that cohort."

Alteryx

MONTHLY RETAINERS AND LONG-TERM ENGAGEMENTS

However, there are exceptions. Some professional services engagements are longer-term in nature and look more like recurring revenue with fixed fees and a term concurrent with the subscription products. For example, an enterprise customer may want to purchase 20 hours of advanced engineering support per month from a SaaS company. The professional services might be contracted on a monthly retainer basis with the SaaS company offering discounted rates offered in exchange for the longer-term visibility into resource utilization.

EXAMPLES INCLUDING PROFESSIONAL SERVICES

None of the SaaS companies we analyzed explicitly stated a policy election to include professional services. However, several that use ARR as the core metric for retention calculations do include professional services in their definition of ARR.

*"We define ARR as the annual recurring revenue of subscription agreements, including **certain premium professional services** that are subject to contractual subscription terms, at a point in time based on the terms of customers' contracts."*

Amplitude

*"Contracts include **portions of professional services contracts** that are recurring in nature."*

Yext

SUMMARY - TYPES OF PROFESSIONAL SERVICES OFFERED BY SAAS COMPANIES

SERVICE	DESCRIPTION	FIXED FEES	TIMING
Professional Services	Other custom projects to provide. Examples include building customer-specific feature enhancements, preparing for major upgrades, or consolidating accounts following a merger.	One-time fee based upon project scoping and statement of work*	Anytime during contract lifecycle.
Managed Services	Throughout contract term, provider is responsible for defined list of day-to-day operational tasks to perform to proactively manage the technology.	Monthly recurring fee published on price list	Throughout each month of contract term.
Premium Support Services	Customer gets access to premium level of technical support with faster response times (SLAs) or direct access to higher level resources such as engineers.	% of annual subscription fees Monthly recurring fee published on price list	Throughout each month of contract term.

*In addition to the fixed fee, there is typically a variable per-hour fee of $150-$250 charged for time worked in excess of the statement of work or productized offering scope.

CUSTOMER SUPPORT

Another form of professional service is premium technical support. These packages offer a higher touch and a more proactive level of engagement with the customer. Premium support might include 24x7 coverage, faster response times, and a designated technical account manager.

Premium support offerings are typically provided over a contract term that is concurrent with the core subscription. Pricing is often a fixed monthly recurring fee. As a result, SaaS providers with customer support offerings often consider the associated revenue to be recurring in nature and included in retention calculations.

EXAMPLES INCLUDING CUSTOMER SUPPORT

*"We calculate dollar-based net revenue retention rate as the implied monthly subscription and **support revenue** at the end of a period for the base set of customers from which we generated subscription revenue in the year prior to the calculation, divided by the implied monthly subscription and support revenue one year prior to the date of calculation for that same customer base."*

Blackline

*"To calculate our dollar-based net retention rate, we first calculate the subscription and **support revenue** in one quarter from a cohort of customers that were customers at the beginning of the same quarter in the prior fiscal year, or Cohort Customers."*

MuleSoft – Historical

EXAMPLES EXCLUDING CUSTOMER SUPPORT

*"This metric is calculated by dividing (a) subscription revenue (including revenue related to messaging utilization above our clients' contracted levels, but **excluding customer support**)."*

ExactTarget - Historical

3.3: PRODUCT LINES

LEGACY OR END-OF-LIFE PRODUCTS

Just because a customer uses a product with a recurring revenue stream, does not necessarily mean that it will be included in retention calculations. Some SaaS providers exclude specific product lines from retention metrics. The most common example is legacy products that have been discontinued or for which no growth is expected.

EXAMPLES OF LEGACY PRODUCT LINES EXCLUDED FROM NDR

"We do not currently incorporate operating metrics associated with our ***legacy analytics product****,* ***our legacy Outbound product, our legacy Starter plan****, our Sell product, Sunshine Conversations, our* ***legacy Smooch product****, free trials, or other free services into our measurement of dollar-based net expansion rate."*

Zendesk

PRODUCTS WITH NON-RECURRING REVENUE

Some SaaS providers exclude specific product lines from the retention metrics, particularly those with non-recurring revenue. For example, many large SaaS companies host annual conferences that generate revenues from registration fees. The revenue streams from these events are typically excluded from net retention rate calculations.

As another example, some fintech companies generate interest income from holding customer cash balances in the days leading up to a payroll run or payment transaction. These fees often are excluded from net retention rate calculations.

EXAMPLES OF SPECIFIC PRODUCT LINES EXCLUDED

*"The calculation **excludes transactional revenue associated with our Cvent CONNECT** client conference and revenue associated with acquisitions where by-client revenue is not available."*

Cvent

*"We **exclude interest income on funds held for clients** from the revenue retention calculation."*

Paylocity

*"Current Period Revenue includes any upsells and is net of contraction or attrition, but excludes revenue from new customers and **excludes interest earned on funds held on behalf of customers**."*

Bill.com

3.4: DEPLOYMENT MODELS

PERPETUAL LICENSE MODELS

Many of the larger, publicly traded software firms we analyzed, were born in the 1980s or 1990s when the dominant model for software was to purchase a perpetual license for the corporate IT team to manage on-premise in the customer's data center. The revenues generated from software providers in this traditional model fell into two categories:

– **Perpetual Licenses** - One-time fees paid by the customer in exchange for a lifetime right to use the software application. As the customer expanded adoption of the software to more users or locations there was often a need to purchase additional licenses.

– **Maintenance Fees** - Annual recurring fees are required to gain access to technical support from the vendor as well as most upgrades. Fees ranged from 15-20% of license costs. Major upgrades sometimes required additional licensing fees.

Perpetual licenses are generally excluded from retention calculations due to the one-time nature of the transactions. However, the associated maintenance fees often are included in retention measurements as these fees are recurring in nature.

HOW PUBLIC SAAS COMPANIES REPORT

EXAMPLE OF PERPETUAL LICENSES EXCLUDED

“We subsequently measure the recurring contract value in the current trailing 12-month period from the cohort of customers from the previous trailing 12-month period. Dollar-based net retention rate is then calculated by dividing the aggregate recurring contract value in the current trailing 12-month period by the previous trailing 12-month period. Recurring contracts are time-based arrangements for subscriptions and ***not include perpetual license or professional services arrangements.****”*

AppDynamics

EXAMPLE OF MAINTENANCE FROM PERPETUAL LICENSES INCLUDED

“To calculate our dollar-based net expansion rate as of the end of a reporting period, we first determine the annual recurring revenue, or ARR, from all active subscriptions (both revenue recognized ratably over the subscription term and upon delivery) and ***maintenance from perpetual licenses*** *as of the last day of the same reporting period in the prior year.”*

Tenable

SELF-MANAGED SOFTWARE WITH SUBSCRIPTION MODELS

Traditional software firms have adopted SaaS and migrated their customers to the cloud over the past decade. Some such as Adobe were early adopters and quickly shifted their customer base to SaaS. Others have pursued a more gradual transition with a meaningful percentage of accounts still on-premise or running in a private cloud.

SELF-MANAGED TRADITIONAL SOFTWARE

To ease the transition, some software providers have introduced new subscription models or term licenses as an alternative to the traditional perpetual license and maintenance contract model. These new term licenses/ subscriptions are not delivered in the "as-a-Service" model, but instead are "self-managed" by the customer. The customer can deploy the software in their own data center, if they have one, in what has been known as an "on-premise" model.

Alternatively, the customer could deploy the technology in their own private cloud at Amazon Web Services, Microsoft Azure, or Google Cloud Platform.

Examples include:
- Checkpoint
- Informatica
- OpenText
- Oracle
- Pega Systems
- PTC
- Splunk

SELF-MANAGED NEW SOFTWARE

Traditional licensed software vendors are not the only companies that offer self-managed options to customers. Several organizations founded between 2008 and 2014 have recently gone public offering both "as-a-Service" models and "self-managed" options to customers. Some development and IT organizations at larger companies prefer to install and manage the software themselves rather than consume an "as-a-service" model.

Similar to the traditional software model described above, these newer self-managed products also are sold on a subscription basis and are deployed in the customer's own private instance of AWS, Azure, or GCP.

Examples include
- HashiCorp
- Elastic
- GitLab
- C3.ai
- MongoDB

NET RETENTION FOR SELF-MANAGED SOFTWARE INCLUDED

Companies with mixed deployment models do not limit their measurement of retention to just the technology they deliver as a service. Software providers include the recurring elements of revenue in retention calculations regardless of whether the customer is self-managing the technology in their own corporate data center or a private cloud.

SUMMARY OF SAAS LICENSING AND DEPLOYMENT OPTIONS

Product Type	Management Model	Deployment Model	Revenue Characteristics	Included in Retention Metrics
Perpetual license	Self-managed by customer	Corporate data center or Private cloud	One-time fee(s)	No
Maintenance contract	Self-managed by customer	Corporate data center or Private cloud	Recurring fee	Yes
Subscription/ term license	Self-managed by customer	Corporate data center or Private cloud	Recurring fee	Yes
Software-as-a-Service	Delivered “as-a-service” by vendor	Vendor’s cloud	Recurring fee	Yes

EXAMPLES OF SELF-MANAGED SOFTWARE INCLUDED

“Our calculation of ARR and by extension Dollar-Based Net Retention Rate, includes both self-managed and SaaS subscription revenue.”

GitLab

SECTION 4

CUSTOMER COHORT

CUSTOMER SEGMENTATION

One of the key factors influencing the retention rate is the cohort of customers included in the comparison of the base and current period revenues. A subset of the SaaS companies we analyzed disclosed policy elections that included or excluded selected customer segments from retention calculations.

There were three different lenses through which these customer segments were identified – 1) customer lifecycle stage (e.g. booked, implemented, expired), 2) firmographic criteria (e.g. industry or geographic region), and 3) contract type (e.g. annual vs monthly plan).

Customer Lifecycle Stage	Firmographic Criteria	Contract Types
Lifecycle Stage • Contract booked • Contract effective • Implemented/Live • Actively using • Late Renewal • Canceled, but not expired	**Geographic Region** • North America • EMEA • Asia Pacific **Vertical Industry** • Government, non-profit • Technology startups **Revenue/Employee Count** • Enterprise • Middle Market • Small Business	**Contract Duration** • Annual contract • Monthly, pay-as-you-go **Free Plans** • Free trials (limited time) • Freemium (free for ever)

We will explore each of these segments in greater detail in the following sections.

4.1: CUSTOMER LIFECYCLE

SAAS CUSTOMER LIFECYCLE

Customers using SaaS products progress through multiple stages as they sign new contracts, begin to use the software, and renew existing agreements. A new customer who signs an annual contract might go through the stages outlined in the table below during the first year of service.

Lifecycle Stage	Stage Description	Critical Date	Example Date
Contract Booked	Contract is signed by the customer and SaaS provider.	Booking date	December 15th, 2023
Contract Effective	Contract term (e.g. one year) starts and the terms of the agreement become effective.	Effective date	January 1st, 2024
Implemented/ Live	Software is activated and configured for the customer to use.	Implementation date	April 1st, 2024
Contract Expiration	Contract term (e.g. one year) ends and the terms of agreement are no longer in effect.	Expiration date	December 31st, 2024
Contract Renewal	Second contract term starts. Updated terms of agreement go into effect.	Renewal date	January 1st, 2025

TRANSITIONS BETWEEN LIFECYCLE STAGES

SaaS companies need to make policy decisions about when a new customer is added to the cohort that is being compared for the retention calculation. For example, what if a new customer has a contract that is:

- **Booked, but not Effective** – The customer signed a contract on December 15th, 2023 but the effective date is not until January 1st, 2024. If the base period ends on December 31st, 2023, should this customer be included in the cohort?
- **Effective but not Implemented** - The contract term has started, but work remains to configure, test, and optimize the software before the customer can begin to use it.

Similarly, SaaS companies need to define policies about when to remove a lost customer from the cohort that is being measured. For example, what if a customer has a contract that has:

- **Expired, but not Renewed** – The contract term has ended without a signed renewal contract, but the customer is still actively using the software and is in the process of negotiating a new agreement.

Customers in each of these three different time gaps may or may not be included in net retention metrics depending upon the policy of the SaaS company. We will explore each of these scenarios in greater depth in the following sections.

BOOKED BUT NOT EFFECTIVE

Suppose a SaaS company is comparing the calendar years 2023 (base) and 2024 (current) for its net retention metric.

NEW ACCOUNT SCENARIO

A new customer is booked in the closing days of the base period (2023), but the contract is not effective until the current period (2024). Should the revenue associated with the booked contract be included in the base period when calculating retention?

COHORT CUTOFF DATE

Some SaaS companies have cutoff dates at which the contract must be effective in order to be included in the cohort. The cutoff is not necessarily the last day of the base period. It could be the first day of the base period as well. For example, if the base period was calendar year 2023.

– First Day Cutoff – Contract must be effective by January 1st, 2023
– Last Day Cutoff – Contract must be effective by December 31st, 2023

EXPANSION SCENARIO

Another challenging scenario would be if an existing customer signs an expansion agreement in the closing days of the current period (2024), but the contract is not effective until the following year (2025). Should the expansion revenue be included in the current period when calculating retention?

EXAMPLE OF BOOKED, BUT NOT EFFECTIVE

*"We measure ARR from renewed and new sale opportunities **booked as of the last day** of the current reporting period."*

PowerSchool

*"A customer will not be considered a Base Customer unless such customer has an active subscription **for the entirety of the Base Quarter."***

Alteryx
Historical (2017)

EFFECTIVE BUT NOT IMPLEMENTED

Again, suppose the same SaaS company is comparing the calendar years 2023 (base) and 2024 (current) for its net retention metric.

NEW CUSTOMER SCENARIO

A new customer's contract becomes effective in the last few months of the base period (2023), but the software is not implemented and used until the current period (2024). Should the revenue associated with the contract be included in the base period when calculating retention?

COHORT CUTOFF DATE

Some SaaS companies have cutoff dates at which the customer must be live in order to be included in the cohort. The cutoff is not necessarily the last day of the base period. It could be the first day of the base period as well. For example, if the base period was calendar year 2023.

- First Day Cutoff – Customer must be live by January 1st, 2023
- Last Day Cutoff – Customer must be live by December 31st, 2023

EXAMPLES OF EFFECTIVE, BUT NOT IMPLEMENTED

"We calculate our net revenue retention rate as the total revenues in a calendar year, excluding any revenues from acquired customers during such year, from customers who were ***implemented*** *on any of our solutions as of December 31 of the prior year…"*

Q2

"We do not consider a customer as a Base Customer unless there is ***at least one location live*** *on the Toast platform for the entirety of the Base Month."*

Toast

"Next, we define as our measurement cohort the population of customers under capacity contracts that ***used our platform at any point in the first month of the first year of the measurement period****…Any customer in the cohort that did not use our platform in the second year remains in the calculation and contributes zero product revenue in the second year."*

Snowflake

EXPIRED, BUT NOT RENEWED

Some SaaS customers do not renew on time prior to their contract expiration dates. If the customer is in the process of negotiating a renewal agreement (or the sales team believes they will renew), then the SaaS provider will continue to offer service.

For example, suppose a SaaS customer's contract for \$100K ARR expires on December 31st of 2023. The customer is in discussions with the Customer Success Manager (CSM) about a renewal with expansion but wants commitment from the SaaS provider that important new product features will be delivered in 2024. Due to the complexity of the negotiations caused by the desire for product roadmap changes, the renewal is not processed by December 31st. Negotiations continue until March 15th at which point a new contract is signed covering the period from January 1st to December 31st of 2024 with an ARR of \$150K.

Theses scenario creates complexity for net retention metric calculations.

Should the revenue from these late renewals are included in the retention calculations for January and February?

If late renewal revenue is considered churn, then the lost revenue (e.g. \$100K) will have a temporary, negative impact on retention figures for one or more months. Once the contract is renewed, the retention figures will be updated and corrected. Prior periods may need to be restated if the renewal contract is backdated to match the expiration date.

The alternative is that the late renewal revenue is not considered churn. In these scenarios, the \$100K from the prior year contract would be included in the numerator (current year revenue) for calculations. As a result, the retention level might be overstated for the period between the contract expiration and the renewal.

Most of the SaaS providers we analyzed did not share a policy for late renewals. However, several did call out their policy of including revenue from these late renewal accounts in ARR reporting. If ARR is the core metric for retention, then the late renewals are also included in the net retention metric.

EXAMPLES OF LATE RENEWALS IN ARR

"ARR is calculated as the sum of the annualized value of our subscription contracts as of the measurement date, ***including existing customers with expired contracts that we expect to be renewed****."*

ON24

"To the extent that we are negotiating a renewal with a customer after the expiration of the subscription, ***we continue to include that revenue in ARR if we are actively in discussion*** *with such an organization for a new subscription or renewal, or until such organization notifies us that it is not renewing its subscription."*

Crowdstrike

"The aggregate ARR calculated at the end of each reported period represents the value of all contracts that are active as of the end of the period, ***including those contracts that have expired but are still under negotiation for renewal. We typically allow for a grace period of up to 6 months past the original contract expiration quarter during which we engage in the renewal process before we report the contract as lost /inactive.*** *This grace-period ARR amount has been less than 2% of the reported ARR in each period presented.* ***If there is an actual cancellation of an ARR contract, we remove that ARR value at that time****."*

Informatica

"We calculate Annualized Net Revenue Retention by aggregating the annualized revenue from all paying Dropbox Business customers subscribing to a Dropbox Business plan at the beginning of the period, then aggregating the annualized revenue from those same Dropbox Business customers at the end of the period. ***For customers whose renewal is pending at the end of the period, we include their annualized revenue in the ending total if they resume payment within 30 days from the end of that period****. Annualized Net Revenue Retention is equal to ending annualized revenue divided by beginning annualized revenue."*

Dropbox – Historical (2018)

4.2 FIRMOGRAPHIC CRITERIA

EXCLUDED CUSTOMER SEGMENTS

SaaS and cloud providers are selective about which customer segments to include in retention reporting. Just because a customer uses a product with a recurring revenue stream, does not necessarily mean that it will be included in the cohort used for retention calculations. The segments that are excluded are typically customer groups that are less strategic to the SaaS provider or those with a higher propensity to churn.

The most excluded groups are small businesses, which have a higher risk of insolvency, business strategy change, or exit via an acquisition. Another group that is commonly excluded are customers acquired through self-service, digital channels, which often are small businesses.

Some SaaS companies exclude customers with relatively low spend independent of the company's revenue or employee count. For example, a Fortune 500 company that is only spending $1K per month might be excluded from its net retention metric calculation, even though the company has 50,000 employees.

EXAMPLES THAT INCLUDE ONLY SELECTED CUSTOMER SEGMENTS

*"Our net dollar expansion rate includes the increase in user adoption within our **Enterprise customers**, as our subscription revenue is primarily driven by the number of paid hosts within a customer and the purchase of additional products, and compares our subscription revenue from the same set of Enterprise customers across comparable periods."*

Zoom

*"We calculate net dollar expansion rate as of a period end by starting with the ARR from customers with **greater than 10 employees** as of the 12 months prior to such period end (Prior Period ARR)."*

Zoom - Historical 2019

*"We calculate the net revenue retention rate by dividing: (a) the current annualized recurring revenue for **premium customers** that existed twelve months prior by (b) the annualized recurring revenue for all premium customers that existed twelve months prior."*

Brightcove

HOW PUBLIC SAAS COMPANIES REPORT

EXAMPLES THAT EXCLUDE SELECTED CUSTOMER SEGMENTS

*"Currently, our net revenue retention rate includes only customers with unique account identifiers in our primary U.S. billing systems and **does not include** customers who subscribe to our solutions through our **international subsidiaries or certain legacy billing systems** that have not been integrated into our primary U.S. billing systems."*

Avalara

*"We exclude **political and advocacy customers**, which represented 6.3% and 1.5% of revenue for 2022 and 2021, respectively, from our calculation of annual NRR rate because of the **biennial nature of these customers**."*

Zeta

*"Customers with **more than 10 users** are the core focus of our sales and marketing efforts; therefore, their Net Dollar Retention is a key metric we measure."*

Monday.com

*"For the purposes of this calculation, subscription revenue **excludes** subscriptions for **individuals and small practices** and other non-recurring items."*

Doximity

*"We define our net revenue retention rate as the total current period revenue earned from advertiser customers, which were also customers during the entire most recent twelve-month period, divided by the total prior year period revenue earned from the same advertiser customers, **excluding a portion of our revenues that cannot be allocated to specific advertiser customers**."*

DoubleVerify

*"For clarity, we do not include customers serviced via our **digital channel** in this metric."*

Docusign

SEGMENT REPORTING ON RETENTION

Some companies report separate metrics for separate segments of customers defined by firmographic criteria. For example, before its acquisition SurveyMonkey reported on a Dollar-Based Net Retention Rate for organizations (multi-user businesses) and individuals (consumers or single user businesses).

EXAMPLE - TWO METRICS REPORTED FOR DIFFERENT CUSTOMER SEGMENTS

Organizational Dollar-Based Net Retention Rate

*"We calculate organizational dollar-based net retention rate as of the end of a period by starting with the annualized revenue from the cohort of **all domain-based customers** as of the 12 months prior to the end of such period, or the Prior Period Annualized Organizational Revenue."*

Individual Dollar-Based Net Retention Rate

*"We calculate individual dollar-based net retention rate as of the end of a period by starting with the annualized revenue from the cohort of **all individual paying users** as of the 12 months prior to the end of such period, or the Prior Period Annualized Individual Revenue."*

SurveyMonkey – Historical

4.3: CONTRACT TYPES

Another lens through which SaaS providers view customers is by the level of contractual relationship that exists.

MONTHLY VS ANNUAL PLANS

Most SaaS providers prefer to have customers commit to annual contracts. In fact, many providers only offer customers a choice of annual plans. However, a meaningful number of providers offer monthly, pay-as-you-go options as well. Monthly plans typically offer customers the right to cancel at any time without penalty. The flexibility to test the product without the risk of having to enter into a long-term relationship helps to remove the commitment barrier that is often one of the biggest hurdles to new customer acquisition.

SAAS & CLOUD PROVIDERS OFFERING MONTHLY PLANS		
Google Workspace	Amazon Web Services	Hubspot
Zoom	Microsoft Azure	DigitalOcean
Monday.com	Google Cloud Platform	Squarespace

Customers on monthly plans typically have the right to cancel at any time without penalty. As a result, accounts on monthly plans often have much higher attrition rates than those with annual contracts. To avoid the impact of monthly account churn, some SaaS providers exclude these pay-as-you-go accounts from the cohort of customers analyzed for retention.

HOW PUBLIC SAAS COMPANIES REPORT

EXAMPLES – EXCLUDING MONTH-TO-MONTH CUSTOMERS

*“We **exclude** from our calculation of ARR **any revenues derived from month-to-month agreements** and/or product usage overage billings, where customers are billed in arrears based on product usage.”*

Dynatrace

*“Next, we define as our measurement cohort the population of customers **under capacity contracts** that used our platform at any point in the first month of the first year of the measurement period.”*

Snowflake

*“We calculate our retention rate as of a period end by starting with the annual contract value (ACV) from customers with contract value of $5,000 or more as of 12 months prior to such period end (Prior Period ACV) and a **subscription term of at least 12 months**.“*

Box – Historical (2015)

EXAMPLES – INCLUDING MONTH-TO-MONTH CUSTOMERS

*“The ARR includes **monthly subscription customers** so long as we generate revenue from these customers. We annualize our monthly subscriptions by taking the revenue we would contractually expect to receive from such customers in a given month and multiplying it by 12.”*

JFrog

FREE TRIAL CONVERSIONS

Another group of customers that needs to be considered for retention calculations are those on free plans.

FREE TRIAL

Many SaaS providers offer customers a free trial, which enables users to try the product before making any financial commitment. Trials are typically limited to 14 or 30 days and offer access to a limited feature set. Free trials are a new customer acquisition strategy that helps to reduce the risk for buyers who are hesitant about making a financial commitment.

The goal of the free trial is to enable the customer to gain real-world experience realizing the value of the product. Trials are often methodically designed to encourage the users take the time to configure the SaaS application for their business needs. Once the application is setup and delivering value, the customer will be less likely to cancel it.

FREEMIUM

Another type of free plan is the freemium plan. Unlike free trials these plans are not limited time period. SaaS providers sometimes describe them as “free forever” plans. However, much like free trials the level of functionality offered is limited.

Freemium plans are also new customer acquisition strategies. Compared to free trials, freemium plans offer even lower friction and longer test periods for customers to experiment and adopt the product.

FREE-TO-PAID UPGRADES

Customers on free plans create complexity for net retention metrics. For example, suppose there are 1,000 customers on free plans in the year 2023. During 2024, 100 of those 1,000 customers upgrade to a paid plan. The 100 customers upgrading could be viewed as either as:

- New logos that should be excluded from the cohort used for the retention calculation
- Expansion accounts that should be included in the cohort used for the retention calculation

HOW PUBLIC SAAS COMPANIES REPORT

Most SaaS companies did not disclose a policy related to free-to-paid conversions. The few that did provide specifics, excluded free-to-paid plans from net retention metrics.

EXAMPLES – EXCLUDING PAID CONVERSIONS

"Our dollar-based net retention excludes the benefit of ***free customers that upgrade to a paid subscription*** *between the prior and current periods, even though this is an important source of incremental growth."*

Cloudflare

"Current Period MRR includes expansion within Paid Customers and is net of contraction or attrition over the trailing twelve months, but excludes revenue from new Paid Customers in the current period, including ***those organizations that were only on Free subscription plans*** *in the prior period and converted to paid subscription plans during the current period."*

Slack

"We ***do not*** *currently incorporate operating metrics associated with our legacy analytics product, our legacy Outbound product, our legacy Starter plan, our Sell product, Sunshine Conversations, our legacy Smooch product,* ***free trials, or other free services*** *into our measurement of dollar-based net expansion rate."*

Zendesk

CHURN CATEGORIES

Another approach to segmenting customers for retention calculations relates to the cancellation reason. A simple way to segment based on churn reason would be to group customers into those with voluntary or involuntary attrition. Voluntary attrition would include accounts that were unsatisfied with the product's value, elected to switch to a competitor, or, for some other reason, no longer required the software. Involuntary attrition would include accounts that went bankrupt or decided to discontinue operations.

There was one SaaS company that disclosed a policy election related to churn categories.

EXAMPLES – EXCLUDING INVOLUNTARY ATTRITION

"Current Period ARR includes expansion within existing clients inclusive of contraction and voluntary attrition, but excluding involuntary cancellations. We define involuntary cancellations as accounts that were canceled due to the client no longer being in business. We identify involuntary cancellations based on representations made by the client at the time of cancellation."

Enfusion

4.4: DISTRIBUTION CHANNELS

Some SaaS and cloud providers exclude revenues generated from third-party distribution channels from retention calculations, electing to only include revenue booked through the direct sales organization. One reason to exclude revenues from distribution channels is a lack of visibility into the end-customer contract dynamics. Resellers, VARs, marketplaces, and other distribution channels may not share the names of accounts and associated revenues with the SaaS provider. In these scenarios, the SaaS provider would need to treat the distributor as one large customer or exclude the revenues altogether.

EXAMPLES – EXCLUDING SELECTED DISTRIBUTION CHANNELS

*"The Annual Net Revenue Retention Rate **excludes revenue from B2B partnerships**."*

Wix

*"For the purposes of calculating Net Revenue Retention Rate, we **exclude from our calculation any changes in ARR attributable to Intersect customers, as this product is sold through our channel partnership** with EAB and is pursuant to annual revenue minimums, therefore the business will not be managed based on our net revenue retention ("Net Revenue Retention"). "*

Powerschool

*"We compare the aggregate subscription fees contractually committed for a full month under all customer agreements (the "Total Contractual Monthly Subscription Revenue") of our total customer base (**excluding OEM partners with revenue share agreements**) as of the beginning of each month to the Total Contractual Monthly Subscription Revenue of the same group at the end of the month."*

Docebo

HOW PUBLIC SAAS COMPANIES REPORT

If revenues from distribution channels are growing, then it is beneficial to include the revenues in retention calculations.

EXAMPLES – INCLUDING ALL DISTRIBUTION CHANNELS

*"The cohorts of customers that we present dollar-based net retention rate for **include direct, third-party reseller, and total customers**. Direct customers include enterprise, mid-size and small business customers."*

Yext

*"Starting with the fiscal quarter ended October 31, 2021, the cohorts used to calculate net revenue retention rate **include end-customers under a reseller arrangement**. Although the impact is not material, we have adjusted all prior periods presented to reflect this inclusion."*

Snowflake

SECTION 5

POLICIES

5.1 FOREIGN EXCHANGE

Many US-based SaaS and cloud companies generate revenues from customer contracts billed in foreign currencies such as Canadian dollars, British pounds, Euro, etc. The foreign (transactional) currencies must be converted into the reporting currency (e.g. US dollars) for the purposes of calculating net retention metrics (as well as all the other financials).

Finance organizations at SaaS and cloud companies must decide on the most appropriate method for performing foreign exchange calculations. There are a few common approaches:

1) Some companies reset the exchange rates used for reporting operating metrics on an annual or quarterly basis. For example, the rates used for ARR or net retention rates might be based on the FX rates on the first day of the measurement period.
2) Other companies use an averaging strategy. For example, the FX rates used for metrics like ARR or net retention might be based on the trailing twelve month average.

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EXAMPLES OF FOREIGN EXCHANGE POLICIES FOR RETENTION CALCULATIONS

"We calculate the net dollar expansion rate on ***a foreign exchange neutral basis****."*

Qualys

"Net revenue retention is based on ***constant FX rates****."*

Wix

"Constant Currency Dollar-Based Net Expansion Rate is calculated the same way as our Dollar-Based Net Expansion Rate but ***using fixed exchange rates based on the daily average exchange rates prevailing during the prior 12-month period*** *to remove the impact of foreign currency translations. We believe Constant Currency Dollar-Based Net Expansion Rate facilitates operating performance comparisons on a period-to-period basis as we do not consider the impact of foreign currency fluctuations to be indicative of our core operating performance."*

Agora

5.2: POLICY CHANGES

From time to time, SaaS and cloud companies will elect to make policy changes related to net retention rate calculations. The changes could be related to any of the variables we've discussed in this report. Examples are provided in the table below:

Variable	Example (From)	Example (To)
Retention Terminology	Net retention rate	Net expansion rate
Core Metric	ARR	GAAP revenue
Comparative Period	Consecutive years	Corresponding quarters (Q4 24 to Q4 23)
Smoothing Technique	Point in time (Dec 31, 2024)	Weighted average of last four quarters
Pricing Models Included	Excluding usage fees	Including usage fees
Professional Services	Including monthly retainers	Excluding short term engagements
Product Lines	No exclusions	Excluding legacy, end of life product
Customer Lifecycle	All contracted ARR included	Only live/implemented ARR included
Firmographics	All customers	Only enterprise
Contract types	Only annual contracts	Including monthly + annual
Distribution channels	Only direct customers	Including reseller channels

These changes typically are disclosed to investors. In addition, the finance organization will need to decide if the changes to the policy meet the materiality threshold for restating the results presented in prior results. Examples of policy election changes from public SaaS companies are shared on the following page:

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EXAMPLE – CHANGING THE QUALIFICATION CRITERIA FOR COHORT

"The point at which a client is deemed "lost" is determined based on the terms of our standard services agreement with clients. Beginning in July 2023, commensurate with operational changes related to how we mobilize our services department to manage relationships with clients that have missed a payroll, we amended our standard services agreement and, as a result, ***the point at which a client was deemed "lost" accelerated****. Due to this change in methodology, the TTM Revenue Attrition for the year ended December 31, 2023 (i) includes revenue from certain former clients deemed lost in December 2023 that, under the historical methodology, may have been deemed lost in early 2024, and (ii) excludes revenue from certain former clients that, under the historical methodology, may have been deemed lost in early 2023 but was instead included in the TTM Revenue Attrition for the year ended December 31, 2022."*

Paycom

EXAMPLE – CHANGING THE CORE METRIC

"Starting with the fourth quarter of 2020, we revised our Annual Dollar-Based Retention Rate calculation to ***be based on Net Revenue, rather than Net Invoicing****."*

Five9

EXAMPLE – CHANGING THE NAME AND COMPARATIVE PERIOD

"In previous fiscal years, we have disclosed a net dollar retention rate which was calculated as of the end of each month by considering the cohort of customers on our commerce platforms as of the beginning of the month and dividing our subscription and transaction-based revenues attributable to this cohort in the then-current month by total subscription and transaction-based revenue attributable to this cohort in the ***immediately preceding month****. Net Retention Rate is a different measure than net dollar retention rate."*

Lightspeed

EXAMPLE – ADDING DISTRIBUTION CHANNELS WITH RESTATEMENT

"Starting with the fiscal quarter ended October 31, 2021, the cohorts used to calculate net revenue retention ***rate include end-customers under a reseller arrangement****. Although the impact is not material, we have* ***adjusted all prior periods*** *presented to reflect this inclusion."*

Snowflake

EXAMPLE – CHANGES TO PRODUCTS & REVENUE STREAMS

"During the second quarter of 2021, we revised our net revenue retention rate calculation methodology. Under the prior methodology, revenue from our SST solution was not included in net revenue retention rate. This means that revenue expansion from existing customers adopting our SST solution was not included, while revenue contraction from customers replacing one or more of Avalara's other solutions with SST was included. The revised calculation methodology for net revenue retention rate ***includes revenue from SST****. In addition,* ***professional services revenue is no longer*** *included in the revised calculation methodology, as these services tend to be more one-time in nature."*

Avalara

EXAMPLE – NO RESTATEMENT

"To better align our reported business metrics, beginning in the first quarter of 2023, we revised our dollar-based net expansion calculation to utilize ARR instead of annual contract value, which, if applied to prior periods presented, would have had ***no more than a 1% impact*** *on any such prior period. As a result, we have* ***not recast prior period*** *dollar-based net expansion rates to conform to the current definition because the impact is immaterial."*

Alteryx

5.3: MERGERS + ACQUISITIONS

How soon after a transaction is completed should the results from a newly acquired entity be included in operating metrics such as net retention rates? Merger and acquisition scenarios can present a number of challenges.

The two companies may have been using different approaches to calculate net retention (or the core metric such as ARR) historically. If the results from the newly acquired entity are to be included immediately after the transaction closes, then the historical results need to be re-calculated and may need to be restated.

In some transactions, there may be a deliberate plan to consolidate product lines and end-of-life selected offerings. In other words, there is expected churn of selected revenue streams and customer contracts. These decisions may result in policy changes that impact the net retention rate calculations.

Only a few of the public SaaS companies analyzed disclosed their policies related to reporting on net retention rates following acquisitions. Examples are presented below.

EXAMPLES OF POLICY ELECTIONS FOR MERGERS & ACQUISITIONS

*"Recurring Revenue related to acquired companies, **one year after acquisition**, has been captured as existing customers until such data conforms to the calculation methodology."*

Autodesk

*"Acquired businesses are reflected in our dollar- based net retention rate **beginning one year following the date of acquisition**."*

Engagesmart

*"Any ACV obtained through merger and acquisition transactions does not affect the dollar-based net retention rate until **one year from the date** on which the transaction closed."*

SmartSheet

SECTION 6

SUMMARY

6.1 SUMMARY OF FINDINGS

Our review of 135 publicly traded SaaS, cloud, AI, fintech, and marketplace companies found many interesting differences in how organizations report on retention metrics.

PUBLIC COMPANY REPORTING

Retention is the most widely reported SaaS metric, being disclosed more frequently than ARR/MRR, ARPU, and other popular KPIs. For retention metrics, we found that:

- Net Revenue Retention - 72% (97 of the 135) reported on a net retention metric. 90 of the 135 only reported on net retention rate.
- Gross Revenue Retention - 7% (10 of the 135) reported on a gross metric. 3 of the 135 only reported on gross retention rate.
- Both Net and Gross - 5% (7 of the 135) reported on both gross and net retention.

Approximately one-half of the companies reporting on a net retention metric use a non-standard approach to the calculation or have policy elections limiting the scope of customers, products, or contracts included. For example, 29% of the reporting companies use an averaging technique to blend their current period results with historical results from the past 12 months. Even the terminology used to describe the metric varies widely. Over 30 different terms were used to describe the various metrics, with Dollar-Based Net Retention Rate being the most common.

A summary of the non-standard approaches is provided in the table below.

FORMULAS

There are many different formulas and policy elections being used to calculate net revenue retention. Amongst the 97 that track retention, we found different

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- Formulas - Eight different formulas for net revenue retention were disclosed. The most common is to divide the current period revenue by the base period revenue.
- Revenue Metric - Six different types of “recurring revenue” metrics were plugged into the formulas. GAAP revenue and ARR are the most common. ACV and billings are also used.
- Comparative Period—The most common approach is to compare ARR on the last day of the current and base periods. Others compare consecutive or corresponding months, quarters, and years.
- Smoothing Approaches—Almost one-third of companies use an averaging strategy to smooth out volatility in retention. They use arithmetic or weighted averages of the past 12 months or 4 quarters.

REVENUE STREAMS

SaaS companies take various policy elections to include or exclude certain types of revenue streams. Examples include:

- Pricing Models - Some include overage fees and variable revenue from usage-based pricing in their retention calculations while others do not.
- Professional Services - Some include long-term consulting engagements and premium customer support offerings while others do not.
- Deployment and Licensing Models - Most companies include software maintenance fees from perpetual licenses as well as subscription revenue from self-managed deployments.

CUSTOMER COHORTS

SaaS companies take policy elections to include and exclude certain customer segments from the cohort used for the retention analysis. Examples include:

- Contract Types - Some include monthly, pay-as-you-go plans, while others only include customer revenues on annual contracts.
- Firmographics - Some include all customers in the cohort used for retention measurement, while others exclude small businesses or accounts below certain revenue thresholds.
- Distribution Channels - Some SaaS companies include revenue generated from partners, resellers, and marketplaces in retention calculations. However, others do not.

APPENDIX A: INVESTOR FILINGS REVIEWED

Company	SEC Doc	Fiscal Year End	Company	SEC Doc	Fiscal Year End
2U	10-K	December 31, 2022	LivePerson	10-K	December 31, 2022
Adobe	10-K	December 1, 2023	MeridianLink	10-K	December 31, 2022
Agora	20-F	December 31, 2022	Monday.com	20-F	December 31, 2022
Akamai	10-K	December 31, 2022	MongoDB	10-K	January 31, 2023
Alphabet	10-K	December 31, 2023	nCino	10-K	January 31, 2023
Alteryx	10-K	December 31, 2023	New Relic	10-K	March 31, 2022
Amazon.com	10-K	December 31, 2023	Okta	10-K	January 31, 2023
Amplitude	10-K	December 31, 2022	Olo	10-K	December 31, 2022
Appfolio	10-K	December 31, 2023	ON24	10-K	December 31, 2022
Appian	10-K	December 31, 2023	OpenText	10-K	June 30, 2023
Asana	10-K	January 31, 2023	PagerDuty	10-K	January 31, 2023
Atlassian	20-F	June 30, 2023	Palantir	10-K	December 31, 2022
Autodesk	10-K	January 31, 2023	Paycom	10-K	December 31, 2023
Avalara	10-K	December 31, 2021	Paycor	10-K	June 30, 2023
AvidXchange	10-K	December 31, 2022	Paylocity	10-K	June 30, 2023
Backblaze	10-K	March 31, 2023	PayPal	10-K	December 31, 2023
Bandwidth	10-K	December 31, 2022	PegaSystems	10-K	December 31, 2023
BigCommerce	10-K	December 31, 2022	Ping Identity	10-K	December 31, 2021
Bill.com	10-K	June 30, 2023	Powerschool	10-K	December 31, 2022
Blackline	10-K	December 31, 2022	Procore	10-K	December 31, 2022
Blend Labs	10-K	December 31, 2022	PROS Holdings	10-K	December 31, 2022
Box	10-K	January 31, 2023	PTC	10-K	September 30, 2023
Braze	10-K	January 31, 2023	Q2 Holdings	10-K	December 31, 2022
Brightcove	10-K	December 31, 2022	Qualtrics	10-K	December 31, 2022
C3.ai	10-K	April 30, 2023	Qualys	10-K	December 31, 2022
Checkpoint	20-F	Janary 31, 2023	RingCentral	10-K	December 31, 2022
Cisco	10-K	July 30, 2023	Riskified	20-F	December 31, 2022
Clearwater Analytics	10-K	December 31, 2022	Salesforce.com	10-K	January 31, 2023
Cloudflare	10-K	December 31, 2022	Samsara	20-F	January 28, 2023
Confluent	10-K	December 31, 2023	SEMRush	10-K	December 31, 2022
Consensus	10-K	December 31, 2022	SentinelOne	10-K	January 31, 2023
Couchbase	10-K	January 31, 2023	ServiceNow	10-K	December 31, 2023
Crowdstrike	10-K	January 31, 2023	Shopify	40-F	December 31, 2023
CS Disco	10-K	December 31, 2022	SimilarWeb	20-F	December 31, 2022
Cvent	10-K	December 31, 2022	Smartsheet	10-K	January 31, 2023
DataDog	10-K	December 31, 2022	Snowflake	10-K	January 31, 2023

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Company	SEC Doc	Fiscal Year End	Company	SEC Doc	Fiscal Year End
Definitive Healthcare	10-K	December 31, 2022	SolarWinds	10-K	December 31, 2022
Descartes		April 30, 2023	Splunk	10-K	January 31, 2023
DigitalOcean	10-K	December 31, 2022	Sprinklr	10-K	January 31, 2023
Docebo	40-F	December 31, 2022	Sprout Social	10-K	December 31, 2022
Docusign	10-K	January 31, 2023	SPS Commerce	10-K	December 31, 2022
Domo	10-K	January 31, 2023	Square/Block	10-K	December 31, 2022
DoubleVerify	10-K	December 31, 2022	Squarespace	10-K	December 31, 2022
Doximity	10-K	December 31, 2023	SS&C Tech	10-K	December 31, 2022
Dropbox	10-K	December 31, 2023	Tenable	10-K	December 31, 2022
Dynatrace	10-K	March 31, 2023	Toast	10-K	December 31, 2022
E2open	10-K	February 28, 2023	Twilio	10-K	December 31, 2022
Elastic	10-K	April 30, 2023	UiPath	10-K	January 31, 2023
Enfusion	10-K	December 31, 2022	Varonis	10-K	December 31, 2022
Engagesmart	10-K	December 31, 2022	Veeva	10-K	January 31, 2023
Everbridge	10-K	December 31, 2022	Vertex	10-K	December 31, 2022
EverCommerce	10-K	December 31, 2022	Vimeo	10-K	December 31, 2022
Expensify	10-K	December 31, 2022	VMWare	10-K	January 28, 2023
Fastly	10-K	December 31, 2022	VTEX	20-F	December 31, 2022
Five9	10-K	December 31, 2022	Walkme	20-F	December 31, 2022
Fortinet	10-K	December 31, 2022	Weave	10-K	December 31, 2022
Freshworks	10-K	December 31, 2022	Wix	20-F	December 31, 2022
Gitlab	10-K	January 31, 2023	Workday	10-K	January 31, 2022
Hashicorp	10-K	January 31, 2023	Workiva	10-K	December 31, 2022
Hubspot	10-K	December 31, 2023	Yext	10-K	January 31, 2023
Informatica	10-K	December 31, 2022	Zeta Global	10-K	December 31, 2022
Instructure	10-K	December 31, 2022	Zendesk	10-K	December 31, 2021
Intuit	10-K	July 31, 2023	ZipRecruiter	10-K	December 31, 2022
Jamf	10-K	December 31, 2022	Zoom	10-K	January 31, 2023
Jfrog	10-K	December 31, 2023	ZoomInfo	10-K	December 31, 2022
Kaltura	10-K	December 31, 2022	Zscaler	10-K	July 31, 2023
Klaviyo	S-1A	September 18, 2023	Zuora	10-K	January 31, 2023
Lightspeed	40-F	March 31, 2023			

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