It’s a bunch of charts and tables. How hard could it be?

The answer: deceptively hard. Dashboards do the tricky work of presenting complexity as if it were anything but. Organizing information so that it delivers well to the intended audience requires attention to detail and considerable revision. It’s like that old adage: “If I had more time, I would have written a shorter letter.” Simplification requires skill.

That’s why we’ve put together this guide on dashboard design, complete with an appendix of metrics relevant to SaaS companies. To control for differences in reporting tools, we’ve focused on best practices that apply regardless of which business intelligence solution you use.

These heuristics will help you plan, design, and refine your dashboards so that they communicate clearly and represent your company well.

Happy reporting!

Exago, Inc.
Rhetorical Situation

As with other inherently complex mediums of communication, it requires some finesse to make a dashboard look simple and do its intended job. A great dashboard pleases the eye, communicates clearly to the intended audience, guides that audience from one visual to the next, and facilitates decision making. To build one, it's important to understand the rhetorical situation—what you're trying to communicate and to whom—as well as how to communicate your message clearly. This of course includes aesthetics, but it also means having a baseline understanding of the metrics your audience cares about.

Rhetorical situation can be broken up into five components: text, author, audience, purpose, and setting. In this case, the text is the dashboard, the author is you, and it's really only the other three components that need teasing out.
Audience

It’s crucial to always consider who will be receiving your message, as they’re fifty percent of the communication process. Here are some questions to help you define your audience:

1. ROLES
In a business setting, role amounts to job title and department. Will your audience have roles in common, or will it be mixed? Keep in mind that many people occupy multiple roles at once.

2. NEEDS
What does your audience require from you? What are their expectations? How can you meet them?

3. KNOWLEDGE
What of the subject matter does your audience already know? What gaps might you need to fill in? If there is a knowledge disparity among audience members, how can you get the uninformed up to speed without losing the others’ attention?

Once you’ve defined your audience, design each element of the dashboard with that audience in mind. Strive to anticipate their needs and expectations based on the answers to the questions above. This will minimize your chances of creating a dashboard presenting insufficient, irrelevant, and/or unintelligible information.
Purpose

Dashboards consist of lots of little messages—the quarter’s sales, revenue by territory, average customer lifetime value, etc.—but they combine to form a sort of snapshot of the company’s health. From there, your audience is responsible for making a diagnosis and taking any necessary action. As a result, your job is to make it the dashboard’s message (e.g., “The company is doing well financially but needs to up its marketing efforts to keep pace next quarter” or “Sales are down and the problem appears to be coming from Territory X.”) as readily apparent and accessible as possible.

There are a number of ways to help your audience evaluate the data in front of them.

1. CONDITIONAL FORMATTING

If a metric falls above or below a certain point, set the visual indicator of that metric, be it a bar on a bar chart or a KPI, to reformat, indicating that the threshold has been crossed. In the example below, data values below $20,000 are set to appear red in the chart, emphasizing their relationship to the chart’s benchmark line.
2. ALERTS

When a condition is met, trigger a notification or other event. For example, when the number of unanswered technical support requests hits 5, send an email notification to the team lead with additional information pertaining to that metric, such as how long each ticket has been waiting and how many tickets each support agent is handling at the moment.

3. GAUGES

Use a gauge to show multiple thresholds at once, such as sales minimum, sales quota, and sales goal. The needle's position clearly communicates the current status.

4. BENCHMARK LINES

On just about any chart with a y-axis, you have the opportunity to place one or more benchmark lines to help viewers compare values.

5. DRILLDOWNS & LINKED REPORTS

Allowing your audience to ask additional questions about the metrics on the dashboard can speed up the diagnosis process. If your dashboard is interactive, you can drill into visualizations to display other related data.
6. FILTERS

On interactive dashboards, filters serve as another investigative tool. Limiting how much data appears on the dashboard will help the audience arrive at insightful conclusions.

Setting

Setting refers not just to the time and place a dashboard is going to be viewed, but also to people’s means of viewing it and the state of the conversation it will be entering into. For example, will your dashboard be viewed at the beginning or the end of a board meeting? Will it be viewed on a tablet en route to a client meeting? If it will be part of a slide deck, how can you ensure that your dashboard doesn’t repeat information conveyed elsewhere in the presentation?

As far as the viewing method is concerned, it’s important to confirm that the dashboard will be displayed as intended. If you have a means of giving your dashboard a fixed aspect ratio or a way of testing its responsiveness, take advantage of those tools to minimize the likelihood that your audience will encounter technical difficulties in getting it to display in the first place.
Design

Not all of us are gifted when it comes to color and composition, but that doesn’t mean there aren’t best practices you can follow to make your dashboards look sleek and professional. Here are some design tips to refer to as you work.
Color

The first rule of color is to use it sparingly. It’s generally a good idea to work with a palette of 3-5 colors. One or two won’t provide enough interest, and more than 5 becomes distracting and busy. It’s also a good idea to reserve color for data-carrying elements, such as trend lines and benchmarks lines, leaving things like axis labels neutral so they don’t compete with the dashboard’s intended focal points.

Be sure to include some neutral tones (typically shades of grey) to accompany your palette colors. Avoid shades of grey that are not light or dark but somewhere in the middle, as they will not provide enough contrast to appear clearly on all screens.

The next step is to plan your palette. Many dashboarding tools come with preset themes that control color for you, but what if you don’t like any of them, or they clash with your brand colors, or there aren’t any to begin with? Try some of these approaches instead.
1. USE BRAND COLORS

Nine times out of ten, if you’re building a dashboard, it’s for a company, and that company has brand colors. If you have access to the company’s full color palette, including secondary colors and neutrals, you can use those to skin your dashboard. If you know where to find the brand colors in the wild but don’t have their color codes, you can acquire them by saving an image of the company logo, for example, and using the steps in “Start with a Photo” (#4 below) to detect the colors in that image. Alternatively, you can install a browser plugin like ColorZilla for Chrome and pick colors from web pages without having to save any images.

2. BUILD FROM A SINGLE BRAND COLOR

Let’s say all you have is a single brand color to go on, and it’s up to you to build a palette around that. There are lots of tools out there designed to help you do that, but Adobe Kuler is perhaps one of the easiest to use. Simply type in the hex value of your main color in the bottom swatch box, and use the Color Rule control in the upper left corner to build different types of palettes. In the shot below, I selected Exago’s brand orange as my central color and used the Analogous color rule to generate the other four colors.
3. BUILD A MATERIAL PALETTE

Google uses a design scheme called Material Design and has a whole website dedicated to its principles. Their method of choosing a color palette for a website is to start with a primary color, add a secondary color, and then use shades of both as a palette. Use their [color tool](https://www.coloros.com) to build your own!

![Color Tool](image1)

4. START WITH A PHOTO

The Adobe Kuler tool mentioned earlier allows you to upload a photo and select from a menu of Color Moods to extract palettes from that image. This is an especially helpful tactic if you know your dashboard will include a particular image and you want to avoid clashing.

![Adobe Kuler](image2)
5. GO EXPLORING

In the event that you have no colors whatsoever to start with, Coolers is a neat tool for palette discovery. Just press the spacebar to generate new colors and adjust as you wish!

Once you have your palette, think about balance. Which colors do you want to see the most of? Which will act as accents? Protip: your accent doesn’t have to be a bright or even light color. It simply has to be applied sparsely. If you’re using conditional formatting, settle on your color coding. Which colors will alert your audience to problems? Which will indicate that all is well?

If you have the ability to store your new color palette as a custom theme, do so; and then get to building!
Composition

Dashboarding tools vary dramatically in their layout capabilities and restrictions, so for the purposes of this article, we’re going to assume you have maximum flexibility.

1. SPACING
Keep the margin space between dashboard items uniform for a clean, balanced look. Where more space is needed—to separate two sections of a dashboard, for example—use multiples of your standard buffer space. Say, for example, that you decided to keep 10 pixels of space between dashboard elements, but your dashboard is divided into three sections: Sales, Marketing, and Development metrics. To divide these sections up visually, try separating them by 20, 30, or any number of pixels divisible by 10.

2. TYPOGRAPHY
Remember that sans-serif fonts like Arial and Helvetica are easier than serif fonts like Times New Roman to read on a screen. This is because the serifs—the decorative flourishes at the ends of letter strokes—are harder to represent using pixels. So opt for sans-serif fonts when you can, and use emphasis (like bolding, underlining, italicizing, and font color) sparingly. Use as few font sizes as you can while still conveying your dashboard’s hierarchies and sections.
3. REPETITION
If you have a lot of elements on your dashboard, play around with repeated visualization types and grouping those together. In the example above, deciding to represent all four acquisition metrics using the same style of KPI and grouping them together keeps the dashboard visually organized and easy to scan.

4. NARRATIVE
KPIs should appear at the top of a dashboard because they give the most overarching insight into the subject at hand. That’s what makes them “key.” In general, you’ll want to organize your dashboard visualizations in order of greatest-to-least importance. You can also think of it as a tree structure. In the above example, the KPIs represent overall traffic trends, which can then be broken down and segmented in the chart below. Even though a dashboard isn’t in outline format, you can still organize it using a tree/outline structure to bring out the narrative of your data story.

5. VOLUME
If you have too much content, your dashboard may scroll when viewed on certain devices. Scrolling makes it impossible for viewers to see all content at once, adding tedium to the viewing experience. And in the event that your audience doesn’t have control over the viewing device — for example, if they’re viewing the dashboard on a television screen in your company’s lobby — scrolling makes part of your dashboard completely inaccessible.
Metrics

The key to a successful dashboard is, of course, its content. You’ve got to figure out what information you want to convey and how best to convey it. For a list of metrics to consider including on a SaaS dashboard, see Appendix A at the end of this guide. For tips on picking visualization types once you know what metrics you’d like to display, read on!
Choosing Visualizations

Most dashboarding tools have several chart and visualization types to choose from, so it can be a challenge to find the best fit for a given instance. The first step is to consider your data and what it’s meant to convey.

1. COMPOSITION

Would you like to show the makeup of a set, such as total revenue broken down by product type or company departments broken down into employee training hours? If so, is this information static, or do you want to show how it has changed over time? Pie charts, waterfall charts, and stacked area or bar charts all accommodate these types of use cases.
It's very common in business settings to want to show comparisons: how one year did compared to the year before, how one employee is performing compared to the average, whether sales are trending up or down, etc. Here, the main question is whether you're making one comparison or multiple comparisons. For example, are you comparing Q1 sales to Q2 sales (one comparison), or are you comparing this year’s Q1 and Q2 sales to each other as well as to those of last year (two comparisons)? If the former, you’re looking to build a single-series chart. If the latter, that extra comparative dimension (year) constitutes an extra series, and you’ll need a multi-series chart. Below is an example of a multi-series bar chart depicting this exact scenario for all four quarters of the year. (As you can see, there were no sales in the third and fourth quarters of 2016.)

2. CORRELATION

Are you looking to show the correlation between one or more variables? Scatter charts can be used to show correlation between two variables, and bubble charts can do the same for three.

3. DISTRIBUTION

Are you interested in showing the statistical distribution of your data? Histogram charts are great if you have a single set of data points. If you have two variables to account for, though, try a scatter plot (pictured above). For three variables, go for a 3D area chart.

4. COMPARISON

It’s very common in business settings to want to show comparisons: how one year did compared to the year before, how one employee is performing compared to the average, whether sales are trending up or down, etc. Here, the main question is whether you’re making one comparison or multiple comparisons. For example, are you comparing Q1 sales to Q2 sales (one comparison), or are you comparing this year’s Q1 and Q2 sales to each other as well as to those of last year (two comparisons)? If the former, you’re looking to build a single-series chart. If the latter, that extra comparative dimension (year) constitutes an extra series, and you’ll need a multi-series chart. Below is an example of a multi-series bar chart depicting this exact scenario for all four quarters of the year. (As you can see, there were no sales in the third and fourth quarters of 2016.)
Visualization Best Practices

ELIMINATE UNNECESSARY VISUAL ELEMENTS.
The rule of thumb here is to only include markings that convey valuable information. If your line chart only has one line on it, for example, don’t include a legend; it’s redundant. Similarly, don’t use three-dimensional visualizations unless the third dimension signifies something.

This background image distracts from the pie cart somewhat, and the pie chart’s 3D style only distorts the wedges’ shapes.

AVOID BUSY Backgrounds.
Do not use a photo or textured background for a visualization except in the rare case that it actively facilitates interpretation of the data.

KEEP TABLES BRIEF AND CLEAN.
If you feel a tabular report does a better job of displaying the information in question, try to limit it to only necessary details so that it may be viewed in its entirety. Avoid the need for scrolling, and remove the gridlines to minimize visual noise.

USE GRADIENTS THOUGHTFULLY.
Avoid gradients that will fade into your background and make the visualization difficult to read.
USE INTERACTIVE ELEMENTS APPROPRIATELY.
Do not rely on interactive dashboard elements unless your audience will have the ability to access them via keyboard or mouse command.

LABEL, LABEL, LABEL.
Be sure to include units of measurement on your Y-axes and title/label your visualizations so that their significance isn’t ambiguous.

CONSIDER A REFRESH TIMER.
If your dashboard is set to refresh data at regular intervals, consider adding a countdown timer in one corner so viewers can anticipate when the dashboard will update.
Dashboard Checklist

Revision is an important part of the design process, so we put together this list of tests to help you evaluate your work!

**VIEWER PERSONAS**: This test is designed to gauge your attention to rhetorical situation and can either be a thought experiment or a written exercise. In either case, identify three types of people in your audience and imagine viewing your dashboard from their perspective. Feel free to flesh out their personalities. What do you think they care about? What else is on their mind as they read the data you’re presenting? How much knowledge do they have of the subject? What top pieces of information do they need from the dashboard, and can they find them easily?

**SQUINT**: This tests your color composition and allocation by obscuring detail. View your dashboard from a normal distance and squint. What elements stand out most? Are these data-carrying elements? Now squint at the dashboard from further away. Do the colors clash or harmonize?

**PRIORITY TREE**: This tests your organization. List the topics(elements on your dashboard in descending order of importance, but do not refer to your dashboard as you build this list. Check the list against your dashboard and see whether it’s roughly in the same order, making allowances for composition, of course.

**SCANNING**: This is to check for compositional balance. Print out the dashboard and show it to a colleague. Give her a pen and ask her to divide the dashboard into sections. Did she group elements the way you’d intended them to be grouped? Ask her where her eye went as it scanned the page initially. Did it start where you had intended for it to start?
Appendix A

SaaS KPIs and Metrics

C-Suite Metrics

Executives are concerned with growth. Here are some key metrics to include on your dashboard when your audience is the SaaS C-suite. These, as well as the Marketing, Sales, and Customer Success metrics, are summarized versions of the entries found in this excellent and exhaustive article by Cobloom.

MONTHLY RECURRING REVENUE (MRR)

Measures the predictable and recurring revenue components of your subscription business over the course of a month. For any given month, sum up the recurring revenue generated by that month’s subscriptions.

\[ MRR_t = \text{SUM(Recurring Revenue)} \]

ANNUALIZED RUN RATE OR ANNUAL RECURRING REVENUE (ARR)

Measures the predictable and recurring revenue components of your subscription business over the course of a year. For any given year, sum up the recurring revenue generated by that year's subscriptions.

\[ ARR_t = \text{SUM(Recurring Revenue)} \]
**CUSTOMER CHURN**
Measures the rate at which existing customers cancel their subscription. For a given period $t$, divide the number of customers that cancelled their subscriptions in that period by the total number of customers at the start of the period.

$$% \text{ Churn} = \frac{\text{# Churned Customers}_t}{\text{Total Customers at Start}_t}$$

$$% \text{ Annual Customer Churn Rate} = (1 - (1 - \text{Monthly Churn Rate}))^{12}$$

**REVENUE CHURN**
Measures the rate at which monthly recurring revenue as a result of customer churn. Find the difference between current MRR for time $t$ and past MRR, dividing that by the past MRR.

$$% \text{ Revenue Churn Rate} = \frac{\text{MRR}_{t-1} - \text{MRR}_t}{\text{MRR}_{t-1}}$$

**BOOKINGS**
Measures the total value of all new subscriptions made during a given period. Sum the value all acquired deals during period $t$, including future payments due per the agreement.

$$Bookings_t = \text{SUM} (\text{Value of New Deals}_t)$$

**MRR GROWTH RATE**
Measures the percent new MRR in a given period. Find the difference between the MRR for a given time $t$ and the MRR for $t-1$, dividing by the latter and multiplying by 100 to get the percentage.

$$\text{MRR Growth Rate} = \frac{(\text{MRR}_t - \text{MRR}_{t-1})}{\text{MRR}_{t-1}} \times 100$$
**NET NEW MRR**

Often more reliable than MRR growth rate, net new MRR shows the amount of new revenue generated each month (rather than the percentage). To find this, add the revenue gained from new subscriptions for time \( t \) to the revenue gained as a result of successful upselling and cross-selling for the same period. Subtract from that the churn MRR lost during that period.

\[
\text{Net New MRR} = \text{New MRR} + \text{Expansion MRR} - \text{Churn MRR}
\]

**BURN RATE**

Gross burn rate measures the rate of expenditure over time, and net burn rate measures revenue loss over time.

\[
\begin{align*}
\text{Gross Burn Rate}_t &= \text{Revenue Spent}_t \\
\text{Net Burn Rate}_t &= \text{Gross Burn Rate}_t - \text{Revenue}_t
\end{align*}
\]

**GROSS MARGIN**

Measures the percentage of revenue remaining after the cost of service is subtracted. For a SaaS company, cost of service might include support expenses, application hosting fees, and software licensing fees.

\[
\text{Gross Margin \%} = \frac{(\text{Revenue}_t - \text{Cost of Service})}{\text{Revenue}_t}
\]

**Marketing Metrics**

**UNIQUE WEBSITE VISITORS**

The number of distinct people who visit a site in a given period.
EMAIL SUBSCRIBERS
Number of individuals who have signed up to receive regularly scheduled emails or newsletters.

MARKETING QUALIFIED LEADS (MQLS)
The number of individuals or companies who have demonstrated an interest in the product and given identifying information.

SALES QUALIFIED LEADS (SQLS)
The number of individuals or companies who have demonstrated an interest in the product and entered into the sales process, usually by requesting a demo or engaging in a sales conversation.

OPPORTUNITIES
SQLs that have been vetted and found a good fit for the product. Paying Customers: The number of companies or divisions of a company that have signed subscription contracts.

FREE TRIALS AND DEMO REQUESTS
The number of individuals or companies requesting to either try the product first-hand or see it in use.

MONTH-ON-MONTH SQL OR MQL GROWTH RATE
Measures the rate of lead increase over time. Using SQLs in the example below, know the same formula applies to MQLs.

\[ MoM SQL Growth Rate = \frac{(SQLs_t - SQLs_{t-1})}{SQLs_{t-1}} \times 100 \]
**CONVERSION RATES**

The number of individuals or companies who make it to the next stage in the sales funnel. Examples of this include, but are not limited to: Visitor to Lead, Lead to Customer, and MQL to SQL conversions. In all cases, the conversion rate is the latter number (the smaller number) divided by the former, larger number.

Visitor to Lead conversion rate = \( \frac{\text{Number of Leads}}{\text{Number of Visitors}} \)

Lead to Customer conversion rate = \( \frac{\text{Number of Customers}}{\text{Number of Leads}} \)

MQL to SQL conversion rate = \( \frac{\text{Number of SQLs}}{\text{Number of MQLs}} \)

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**Sales Metrics**

**ANNUAL CONTRACT VALUE (ACV)**

Value of a customer’s contract over a 12-month period.

**TOTAL CONTRACT VALUE (TCV)**

Value of a customer’s contract over its lifetime.

**AVERAGE REVENUE PER ACCOUNT (ARPA)**

Measures how much revenue the average customer generates in a given period.

\[ ARPA = \frac{MRR}{\text{Number of Active Customers}} \]

**AVERAGE SELLING PRICE (ASP)**

The average dollar amount a contract sells for. This is especially helpful if your company has a sliding scale or a range of subscription plans.

\[ ASP = \frac{\text{SUM}(\text{Contract Revenue})}{\text{Number of Contracts}} \]
CUSTOMER ACQUISITION COST
Measures the amount of money it takes to acquire a customer. To calculate, add up all marketing and sales expenditures for a given period and divide by the number of new customers acquired during that period. If you have both free and paying customers, calculate their CACs separately and average them together for a more accurate metric.

\[ CAC_t = \frac{Sales \ and \ Marketing \ Cost_t}{New \ Customers_t} \]

CAC PAYBACK PERIOD
How long it will take a customer to make up for their acquisition cost. To calculate, divide your CAC by the per-customer MRR.

\[ CAC \ Payback \ Period = \frac{CAC}{MRR \ per \ customer} \]

GROSS MARGIN ADJUSTED PAYBACK PERIOD
Measures how long it will take a customer to make up for their acquisition cost, controlling for the ongoing cost of providing and maintaining service.

\[ Gross \ Margin \ Adjusted \ Payback \ Period = \frac{CAC}{(MRR \ per \ customer \times \ Gross \ Margin)} \]

CUSTOMER LIFETIME VALUE (CLV)
Measures the total revenue generated by a single customer from the time they first begin paying to the time they stop, which can include several separate contracts and licenses. CLV does not include referrals that result in contracts with other customers.

\[ LTV = \frac{ARPA}{Customer \ Churn \ Rate} \]
**LTV:CAC**

LTV and CAC mean the most when formulated as a ratio, since an LTV is only good if it’s significantly greater than CAC. David Skok at For Entrepreneurs advocated an ideal LTV:CAC of at least 3:1.

**WIN RATE**

Similar to conversion rates above, win rate measures the percent of total opportunities that became customers.

\[
\% \text{ Win Rate} = \frac{\text{Won Opportunities}_t}{\text{Won Opportunities}_t + \text{Lost Opportunities}_t}
\]

**SALES COMMISSION:ACV**

If your sales team earns commission, it’s valuable to know what percent of the annual contract value those rates are. According to a [2015 Pacific Crest survey](https://www.pacificcrest.com/research/2015-pacific-crest-survey-software-as-a-service-saas) of private SaaS companies, the median sales commission to ACV ratio is about 9%.

**SALES EFFICIENCY (A.K.A. THE SAAS “MAGIC NUMBER”)**

Measures how much revenue you generated in a year compared to the cost of generating it. A sales efficiency ratio of 1 means you’ve recuperated your customer acquisition costs in one year and after that year can expect a profit.

\[
\text{Sales Efficiency} = \frac{(\text{Revenue} \times \text{Gross Margin \%})}{\text{Sales \& Marketing Costs}}
\]

**REVENUE PER LEAD**

The average contract value divided by the number of leads for a given period.

\[
\text{Revenue per Lead} = \frac{\text{ACV}_t}{\text{Number of Leads}_t}
\]
**LEAD VELOCITY RATE**

Measures the percent in new leads each month.

\[ LVR = \frac{(Qualified \ Leads_t - Qualified \ Leads_{t-1})}{Qualified \ Leads_{t-1}} \times 100 \]

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**Customer Success Metrics**

**DAILY ACTIVE USERS (DAU)**

The number of active users on a given day.

**MONTHLY ACTIVE USERS (MAU)**

The number of active users in a given month.

**NET PROMOTER SCORE (NPS)**

Measures the likelihood of your customers to recommend your product to others in an effort to gauge their overall satisfaction. To calculate NPS, you need specific data. Survey customers, asking them how likely, on a scale of 1-10, they are to recommend your product to a friend or colleague. Individuals who respond with an 8 or higher are labeled “promoters,” and those in the 1-6 range are “detractors.” (All others are “passives.”) A positive NPS is considered good, and an NPS over 50 is considered exceptional.

\[ NPS = \% \text{ Promoters} - \% \text{ Detractors} \]
CUSTOMER SATISFACTION SCORE (CSAT)

Also a survey-based rating system, CSAT measures individuals’ satisfaction with the product. Customers are asked “How would you rate your overall satisfaction with the service you received?” and prompted to respond on a scale of 1 to 5. To calculate, find out how many points you received out of the possible total.

\[
CSAT = \frac{\text{SUM(Customer Responses)}}{(5 \times \text{Number of responses})} \times 100
\]

UPSELL AND CROSS-SELL RATE

Measures what percentage of a period’s revenue was the direct result of either a cross-sell or an upsell.

\[
\text{Upsell Rate} = \frac{\text{ACV of Upsells}_t}{\text{Total ACV}_t}
\]

VIRAL COEFFICIENT

Measures the growth of your customer base as a result of successful customer referrals. A viral coefficient of 1.3 means that every customer you acquire will land you another 1.3 customers.

\[
\text{Viral Coefficient} = \frac{\text{(# of Users} \times \text{Average # of Referrals} \times \text{Referral Conversion Rate})}{\text{Number of Users}}
\]

REFERRAL REVENUE

The sum of all the revenue garnered as a direct result of successful referrals.

REFERRAL RETURN ON INVESTMENT

If your company offers customers referral incentives like discounts or gift cards, you can factor them into your referral revenue this way.

\[
\text{Referral ROI} = \frac{\text{LTV} - \text{Referral Incentive}}{\text{Referral Incentive}}
\]
Development and Support Metrics

**LEAD TIME**
The time taken from when an issue is logged or reported to when its resolution is delivered to the customer. Finding average lead time is made easier by classifying defects by either complexity or severity so that like projects can be compared to one another.

**CYCLE TIME**
The time taken from when a developer starts working on an issue to when the code is declared ready for delivery.

**CODE CHURN**
The percentage of a developer’s code that he/she later edits or deletes. The higher the churn rate, the less efficient the developer. Code churn is usually calculated with the help of an IDE.

\[
\text{Code Churn} = \frac{\text{Edited or Deleted Lines of Code}_{\text{dev}}}{\text{Total Lines of Code}_{\text{dev}}}
\]

**PERCENTAGE AUTOMATED TEST COVERAGE**
The percentage of the source code that is executed when a set of automated quality assurance tests is run. Higher percentages indicate a greater likelihood of finding defects before the code is delivered.

**COST PER RELEASE**
Measures the cost—including work hours, salary, licenses, equipment, etc.—per release.
BURNDOWN CHART
Displays the amount of work left to do on a given project or release

**X Axis:** Span of time from the project's start to its end, often represented in days

**Y Axis:** Workload, usually represented in hours or days and calculated based on the number of developers, their efficiency rates, the number of tasks comprising a project, and their estimated cycle time.

**Ideal Tasks Line:** A straight line running from 100% workload at project start to 0% workload at project end, the slope of which represents the ideal ratio of tasks-to-time over the course of the project.

**Actual Tasks Line:** Line representing the actual progression of work over the project's duration, with the line falling below the idea as well as rising above at times.

DEFECT DENSITY
The ratio of defects to quantity of code for a given project. The size of the source code is measured in thousands of lines of code (KLoC).

*Defect Density* = *Defect Count / Size of Release in KLoC*

CRASH RATE
Measures the frequency of application crashes over a given period.

*Crash Rate* = *Number of Crashes / Number of Total Instances*

THROUGHPUT
The number of tasks (or task groups) that can be completed in a given period of time. To count towards throughput, the task must have been completed in the given timeframe but doesn't necessarily have to have been started then. For example, a task begun in January and completed in February would count towards February's monthly throughput.
DEFECTS FOUND
The number of defects found in a given release can be segmented by: the number found during development and/or QA, the number found after release by company employees, and the number found by clients or customers.

SUPPORT TICKET VELOCITY
Measures the percent increase in the number of new support tickets arriving each month \( (t) \).

\[
\text{Support Ticket Velocity} = \frac{(# \text{ New Tickets}_t - # \text{ New Tickets}_{t-1})}{# \text{ New Tickets}_{t-1}} \times 100
\]

ACTIVE DAYS
The number of days in a given timeframe that a developer contributes code to a project. Can be a useful means of discovering workflow interruptions.

AVERAGE TICKET RESPONSE TIME
The average time it takes for a support agent to respond to a new support ticket. Can also factor in response times to all other replies from the customer.

AVERAGE RESOLUTION TIME
The average time it takes for tickets to reach resolution as defined by your team.

SUCCESSFUL RESOLUTION RATE
The rate at which agents are able to successfully resolve customer issues compared to the total number of requests in a given period.

\[
\text{Successful Resolution Rate} = \frac{# \text{ Resolved Tickets}_t}{# \text{ Opened Tickets}_t}
\]
**TICKET ESCALATION RATE**

The rate at which support tickets escalate tickets to a specified authority or supervisor.

*Ticket Escalation Rate = \# Escalated Tickets / \# Opened Tickets*.

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**CHANNEL ATTRIBUTION**

The percent of tickets arriving to you through various channels, which might include chat widgets, your knowledge base, your support email alias, or other departments in your company.

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**THE AVERAGE NUMBER OF REPLIES PER TICKET**

Measures how much back-and-forth typically occurs on a ticket. A reply usually constitutes a message, either from the support agent or from the client.
Appendix B

Resources

Color Tools

**ADOBE KULER**
Adobe’s color wheel gives you the tools to create harmonious color palettes.

**COLORZILLA**
With ColorZilla, you can get a color reading from any point in your browser, quickly adjust this color and paste it into another program.

**MATERIAL.IO**
Create, share, and apply color palettes to your UI, as well as measure the accessibility level of any color combination.

**COOLER**
Generate color schemes with the push of a button!
SaaS Metrics


Exago BI

CREATING AND EDITING DASHBOARDS

VISUAL GALLERY