

What is marketing analytics?

Marketing data analytics is the use and study of data related to marketing activities. Data analytics in marketing is used to determine the success of past campaigns in terms of ROI, conversions, customer behaviour and preferences, and organic traffic. By analyzing the data regarding past campaigns using marketing analytics, marketing departments should be able to use patterns or trends to improve activities, resource allocation, and campaign planning. The marketing data analytics sphere usually includes three components: analyzing the present, reporting on the past, and predicting for the future.

- **Analyzing the present:** Marketers need to assess marketing analytics from current campaigns and activities in order to get a clear picture of where the marketing activities stand and to compare them to past campaigns. In this case, they'll be focused on website traffic and sources for it, social media engagement and click-throughs, as well as the current state of the sales pipeline and revenue metrics.
- **Reporting on the past:** Marketing departments also rely on reported marketing data analytics at the completion of campaigns, focusing on information such as lead conversion, customer lifetime value, and sales funnel churn rate.
- **Predicting for the future:** Finally, marketing departments rely on marketing analytics to plan future projects. This type of data analytics in marketing will include lead scoring, targeted content distribution, and upselling readiness and relies on datasets as well as modelling and AI.

Why is marketing analytics important?

Marketing analytics gives marketers the insights they need to plan successful campaigns and carry out activities that will help them reach their strategic goals. Without marketing data analytics, marketing departments would be reliant on guesswork or anecdotal evidence to make choices about how to spend the budget, what channels to use to promote their brand, and what customers to target to reach the best outcome.

Who uses marketing analytics?

Every member of the marketing team can use some form of marketing analytics. When the chief marketing officer and top-level managers are putting together the company's marketing strategy, they'll use marketing data analytics to design the right strategy. When a marketing manager is putting together the marketing plan, they'll use marketing analytics to determine which channels should receive the most focus when it comes to content distribution. When an SEO specialist is creating a plan for keyword optimization, they'll use marketing analytics to choose the correct keywords to include and important competitor behaviour.

In short, every marketer can benefit from using data analytics in marketing if they take the right actions based on marketing analytics information.

What actions can you take based on analytics?

Marketing departments can take an almost unlimited number of actions based on marketing analytics, but this is a selection of some of the more common options:

Incorporate keywords: Marketers can use keyword analytics software to determine the specific words and phrases they need to optimize in order to gain organic traffic through web searches.

Replicate successful campaigns: Social media data analytics in marketing (there are often basic versions built into each platform) can give marketing departments an understanding of what types of content or topics resonate with followers and result in traffic to the website or newsletter sign-ups. Marketers can then increase that type of content to increase traffic.

Engage new markets: Marketing departments can engage with a new segment of the market or launch a campaign that targets a different demographic if analytics show prospective customers in those areas.

Optimize CRM: Agencies can also address bottlenecks in customer relationship management as marketing analytics are included in those platforms to help assess funnel and churn.

Adjust product fit: Because marketing departments can access behavioural, purchase history, and website journey data for customer bases, they can better predict customers' needs and purchase preferences.

Introducing B2B marketing analytics

B2B and B2C marketing are similar in many ways, but they are also quite different. B2C marketing involves appealing to a customer's emotional reaction with the transactional goal of them purchasing your product or service. On the other hand, B2B marketing involves building brand recognition and relationships that can turn into leads to generate sales. To that end, B2B marketing analytics relies heavily on keyword analysis, target market data, lead generation, lead scoring, and optimizing the lead-to-customer ratio. One basic element to consider with B2B marketing data analytics is using data to get a better picture of the specific demographic of your target audience, which will likely include one or more decision-makers at a company. Using keyword analytics as well as Google Analytics, the marketing team will be able to get a broad understanding of the branding required for this audience. Marketing analytics can help B2B marketers determine the optimal top-of-funnel prospective list, as well as the most successful forms of repeated communication.

Important concepts within marketing analytics

Certain concepts within marketing analytics can be critical to maximizing efforts and resources. These important concepts within marketing analytics can mean the difference between an average marketing team and one that truly excels in research, planning, and execution.

Customer lifetime value (LTV): Marketing departments can use predictive data analytics in marketing to determine the customer's lifetime value to the company based on past purchases, purchase frequency, and average customer lifespan. This allows them to make predictions about future ROI and customer engagement.

Return on investment (ROI): In marketing terms, analyzing ROI refers to the amount of profit or revenue growth that can be attributed to marketing activities. Capturing this ROI data gives companies another metric for marketing teams' success.

Cost per lead: To determine how cost-effective a campaign is, a marketing department must understand the cost per lead data. Cost per lead refers to the average cost for generating a new lead. Cost per lead can be used to help calculate the marketing ROI.

Lead-to-customer conversion rate: Another metric marketing analytics can help measure is the lead-to-customer conversion rate or the percentage of leads that resulted in sales. This type of data can help direct marketing departments to increase marketing that generates specific types of leads that are proving most successful in converting to sales.

Marketing Analytics Using Excel [Simplified]

Excel began to be used as a tool to store and structure data. With time it started being used as an application for small data computations. Today, with various upgradations, it is being regarded as an entry point into the world of analytics. Through this article, let's acknowledge the power of this tool and dive into the world of Marketing Analytics using Excel.

The best thing about excel is that we have all used it for minor data manipulations and for the sake of those easy to make charts. So, we are all well aware how easy it is to navigate through excel. But we have not used this multipurpose tool for one of its most important application- Data Analytics.

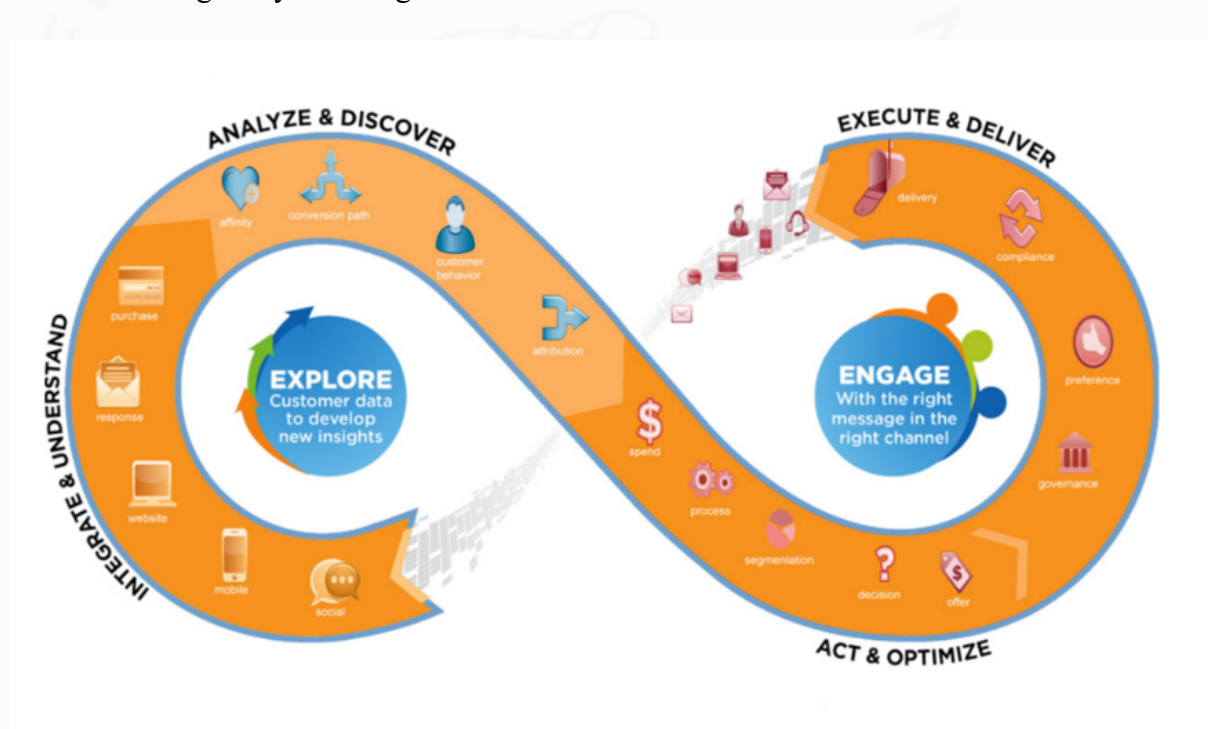
Why Marketing Analytics Using Excel

The reason for preference of Excel for marketing analytics industry wide is threefold:

- **Easy to Use:** Excel does not involve stringent coding techniques. It has commands that are simple and user-friendly which guide you through the process. It is the first step for someone looking to enter the field of analytics.
- **Range of Application:** Excel is one tool capable of storing, sorting, arranging, computing, analyzing and then presenting data in the most lucid manner. This is the reason why it has crossed industries and departments with its utility.
- **Entry Point to Complex Data Analytics:** Learning excel is fundamental for any professional or academic career in data analytics. Its visual, its transparent and it keeps things simple and hence its wide application.

Marketers handle tons of data whether it be related to sales, product pricing, customer feedbacks and other customer insights. All firms are engaging in data driven marketing in order to optimize marketing efforts to the empowered consumer. Analytics is the key to convert this data into information.

Marketing analytics using Excel can be easily done with the varied functionalities of excel in analytics domain. Let's touch upon those domains and try to get a fair understanding of how to do marketing analytics using excel.



Excel to Summarize Marketing Data

Think of a scenario where you are the Area Sales Manager at a footwear firm. You are to analyze the following:

- Investigate the sales volume and % Sales for every month and for different products.
- Analyze the impact of weekends and festive seasons on your sales volume.
- Study the impact of a marketing promotion on sales.

Do these scenarios seem relevant to you? They should because these are the kinds of analysis most of us would be doing once, we get to our jobs.

The data that is made available is in the form of rows and columns of random numbers and text. It is important to slice and dice this data to gain insights.

Pivot Tables help with summarizing large detailed data sets into compressed insights. Not only that, with the help of slicers it is easy to navigate through data by quick filtering. Pivot tables also help in data visualization which makes it easy to study as well as present data.

- Counting and Summing Functions: COUNTIF, COUNTIFS, SUMIF, SUMIFS, AVERAGEIF, AVERAGEIFS
- Statistical Functions: AVERAGE, STDEV, RANK, PERCENTILE, PERCENTRANK
- Array Functions: TRANSPOSE, FREQUENCY

Pricing

Understanding product pricing and how that particular price impacts customer is one of the most important and frequent issues for a marketing manager. In order to do so, marketers should have a fair understanding of the consumer demand curve.

Linear and Power Demand Curves

These curves are used to study the consumers purchase trend with respect to prices keeping the elasticity of the product in mind. Pricing analytics is one important domain of marketing analytics using excel.

Linear Demand curves represent a straight-line relationship between price and demand.

Power Demand curve forms an arc between the price and demand.

Price Bundling

Until now we have discussed linear pricing models. The customer pays equal amount whenever he makes a purchase of the product. But what happens when the products are bundled together and the price of the bundle is not equal to the summation of prices of individual products.

- Why do companies go for product bundling?

For the simple reason which is to motivate the customer to purchase several products and services from the same company. In bundled price, companies try to sell products for a lower price than what would be charged if products would be bought individually.

- **How to determine that price which is attractive for the customers and is profitable to the company?**

The pricing of bundles assumes consumer surplus. Consumer surplus is basically the value a customer attaches to a product minus the actual cost of the product. The consumer is most likely to choose a product combination that has the highest consumer surplus.

Forecasting

Often marketers need to establish relationship between different variables. Whether it be the effect of pricing on sales, the impact of advertisements on product demand or how is allocation of a particular shelf space related to sale of that product.

Linear and Multiple regression models are used to help forecast the impacts of such variables. Regression models can be run with the Data Analysis add-in in excel. This is one important applications of marketing analytics using excel.

Analysis of What Customer Wants

Marketing analysts more often than not have to figure out what aspect of a particular product are more appealing to customer and which ones are least.

Think of a scenario where two similar products from two different brands are seeing a varied response from the customer.

Conjoint Analysis

Conjoint analysis helps in determining which product attributes drives sales for a particular product. What are the factors that influence sales of apparels in a showroom?

- **Is it the price of the clothes?**
- **Is it the look and feel?**
- **Is it the promotional discounts?**
- **Is it the personal assistance provided by sales team in the show room?**

Conjoint analysis is done by listing the various product options available and then weighing them based on listed attributes. The consumer is asked for their preference of particular product attributes and rank them in order.

After the data is gathered, regression analysis can be used to highlight the importance of product attributes. This is another great representation of marketing analytics using excel.

Estimating Customer Value

If a company keeps on spending more to acquire customers than the value customers generate, then such companies will struggle to remain in business. Here it becomes important to analyze customer lifetime value and use these calculations to drive profit for the company.

Monte Carlo Simulation

Monte Carlo simulation is used when the profitability is to be calculated for outcomes in a process that is unpredictable due to intervention of random variables.

Think of yourself as the marketing manager or a product manager of a firm. You are looking to introduce a new product in the market and are looking to estimate the ideal profits from the product. There are various random variables involved namely the market scenario that will determine the price of the product and its sales and unit cost. In such scenarios, Monte Carlo simulation leads the way.

Optimizing Retention and Acquisition Spending

Firms generally have two ways in which they can increase their revenues. They can either go for retaining their existing customers which comes at a cost or work on acquiring new customers which again has an associated cost.

It is the balance of the two that firms generally want to achieve.

Excel solver can be effectively used to solve such problems and reach at a conclusive solution.

Retailing

The billing desk at a retail shop is an epicenter of truckloads of data that can be used to gain useful customer insights. This data if used properly can drive growth for a particular business. This is yet another application of marketing analytics using excel.

Marketing research studies have found that customers usually buy pairs or sets of some products together. This insight can be used to place these two products close to each other to increase total store sales.

Market Basket Analysis using Excel

Market basket refers to the list of products a customer purchases on a visit to a retail store.

There are useful insights that can be drawn from a customer's basket.

For e.g.; Most customer, when they are buying a torch, will also buy batteries because the torch batteries may die anytime and for such situations the customer wants to keep themselves stocked.

Lift is the most widely used tool for market basket analysis. Lift for two products purchased together is calculated by the formula:

= (Actual no. of times the combination occurs)/ (Predicted no. of times combination occurs if items were purchased independently)

Let's say for instance lift is to be calculated for a combination of bread and eggs brought together.

Let's say the actual no. of transactions where eggs and bread were purchased together are 200. There is total 1000 transactions from the store where the no. of times egg was purchased is 300 and the fraction of times bread was purchased is 600.

- Fraction of times eggs were purchased= $300/1000= 0.3$
- Fraction of times bread was purchased= $600/1000= 0.6$
- Lift for a combination of bread and eggs= $200/ (1000*0.3*0.6) = 200/180= 1.11$

Lift much greater than 1 indicate a tendency of customers for items to buy these items simultaneously.

Multiple two-way and three-way combinations can be analyzed for a store with the help of functionalities of excel.

The lift concept can be used to optimize store layouts as it can suggest various product combinations that have a higher tendency to be bought together in order to increase store sales.

These are some of the many applications of excel in marketing analytics. I hope you have a fair idea by now that how vital it is to learn this fundamental tool in order to step into the world of marketing analytics.

Digital Marketing Analytics

Digital analytics is the study of various forms of business data in order to improve the online experience of a business for its customer.

Web analytics has been in the industry for a quite a long time which helps in understanding website data. But with other forms of digital media gaining momentum like search, e-mails, social media, etc. it evolved into digital analytics.

Custom Dashboards

It is possible and recommended to create customized dashboards for your businesses' applications. These can include customized conversion events and KPIs that can help analyze user behaviour on your website.

Content Analytics

Content is the king in today's world. In such a case it becomes imperative to understand what content is working for which kind of customer and then formulating your content strategy.

There are 7 basic metrics that any business would want to analyze to measure the success of their content strategy:

- Audience Size
- No. of repeat visitors
- Time spent on site
- Pages viewed per visit
- Individual web page traffic
- Traffic Sources (Social Media, google search)
- Geo Metrics (Location)

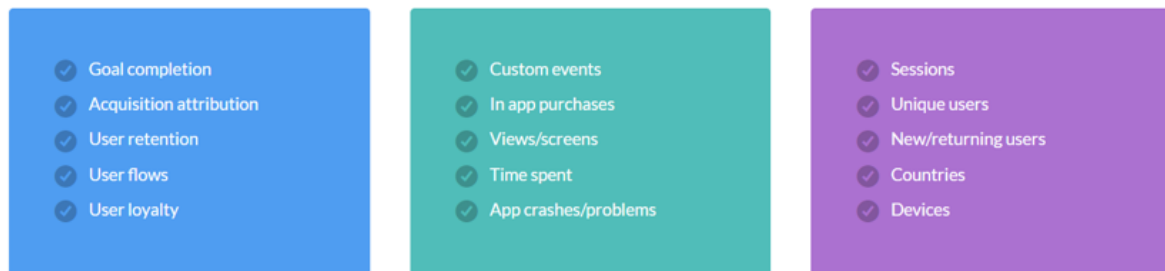
Tools like Matomo and SqueezeCMM help to build and store your content database that will help you to improve your ROI of content.

SEO tools like SEMRush and Ahrefs help with deciding your content strategy based on powerful keywords and then analyze the performance of your page.

Mobile Analytics

Mobile analytics focusses on measuring user interaction with the app along with the app metrics itself like no. of app installs, user retention, app versions and more.

Google analytics is a free tool that works well for in-app data analysis. The premium version gives more detailed insights. Some other platforms like Localities provide useful insights about user-app interaction and this tool is priced according to the data volume generated.



Social Media Listening

Social listening refers to analyzing conversations and trends that are happening not just around your brand but also around the industry that you operate in. Social listening helps on various fronts out of which some have been listed below:

- **Brand Health:** Gauging customer perception of your brand
- **Industry Insights:** Analyzing discussion or hashtags within an industry
- **Campaign success:** How a campaign is resonating with the customers

Tools like Sproutsocial's Smart Inbox can help you capture more and more conversations that are relevant to your brand or industry.

These are some of the many strategies and tools that are available today to analyze your customer's digital presence and journey.

Conclusion

- Organizations are flooded with data about consumer choices. Marketing analytics is the interpretation of this data to gather useful insights that help to increase customer satisfaction and ROI of every marketing decision
- Data analysis using Excel with its wide range of functionalities and solver options can enable marketers to formulate answers to key decisions in marketing -Pricing, Ad spend, shelf space allocation, consumer behaviour
- Digital marketing analytics help translate customer behaviour on digital media into useful insights.

Simple linear regression is used to estimate the relationship between **two quantitative variables**. You can use simple linear regression when you want to know:

1. How strong the relationship is between two variables (e.g., the relationship between rainfall and soil erosion).
2. The value of the dependent variable at a certain value of the independent variable (e.g., the amount of soil erosion at a certain level of rainfall).

Regression models describe the relationship between variables by fitting a line to the observed data. Linear regression models use a straight line, while logistic and nonlinear regression models use a curved line. Regression allows you to estimate how a dependent variable changes as the independent variable(s) change.

Simple linear regression example

You are a social researcher interested in the relationship between income and happiness. You survey 500 people whose incomes range from 15k to 75k and ask them to rank their happiness on a scale from 1 to 10.

Your independent variable (income) and dependent variable (happiness) are both quantitative, so you can do a regression analysis to see if there is a linear relationship between them.

Assumptions of simple linear regression

Simple linear regression is a **parametric test**, meaning that it makes certain assumptions about the data. These assumptions are:

1. **Homogeneity of variance (homoscedasticity)**: the size of the error in our prediction doesn't change significantly across the values of the independent variable.
2. **Independence of observations**: the observations in the dataset were collected using statistically valid sampling methods, and there are no hidden relationships among observations.
3. **Normality**: The data follows a normal distribution.

Linear regression makes one additional assumption:

4. The relationship between the independent and dependent variable is **linear**: the line of best fit through the data points is a straight line (rather than a curve or some sort of grouping factor).

How to perform a simple linear regression

Simple linear regression formula

The formula for a simple linear regression is:

$$y = \beta_0 + \beta_1 X + \epsilon$$

- **y** is the predicted value of the dependent variable (**y**) for any given value of the independent variable (**x**).
- **B₀** is the **intercept**, the predicted value of **y** when the **x** is 0.
- **B₁** is the regression coefficient – how much we expect **y** to change as **x** increases.
- **x** is the independent variable (the variable we expect is influencing **y**).
- **e** is the **error** of the estimate, or how much variation there is in our estimate of the regression coefficient.

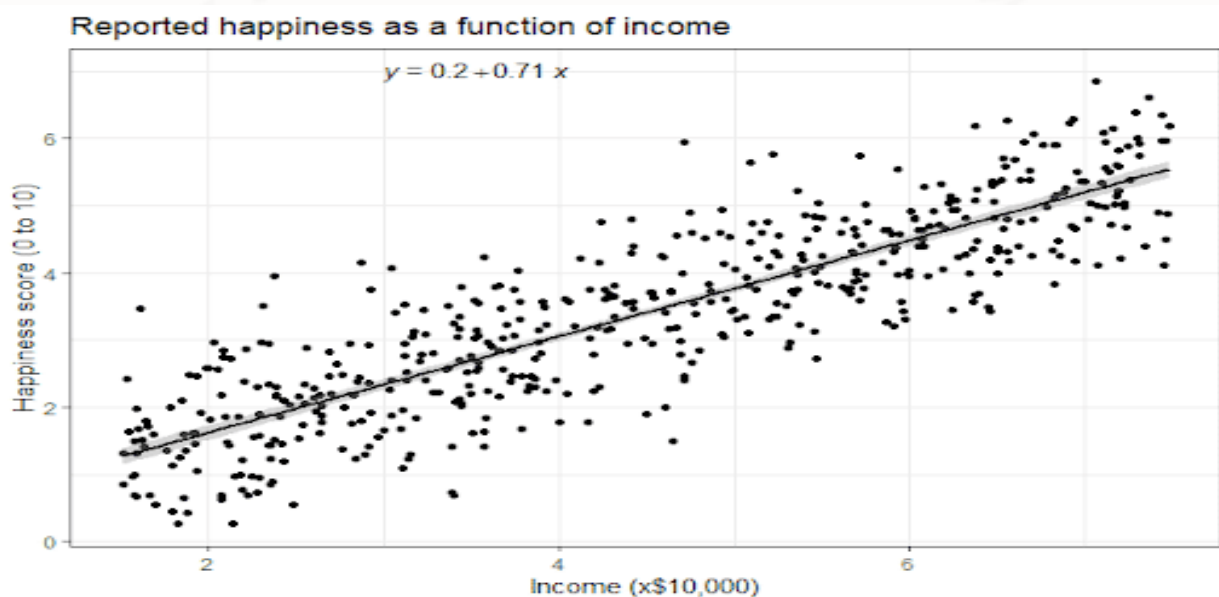
Linear regression finds the line of best fit line through your data by searching for the regression coefficient (**B₁**) that minimizes the total error (**e**) of the model.

While you can perform a linear regression by hand, this is a tedious process, so most people use statistical programs to help them quickly analyze the data.

Presenting the results

When reporting your results, include the estimated effect (i.e. the regression coefficient), standard error of the estimate, and the *p* value. You should also interpret your numbers to make it clear to your readers what your regression coefficient means:

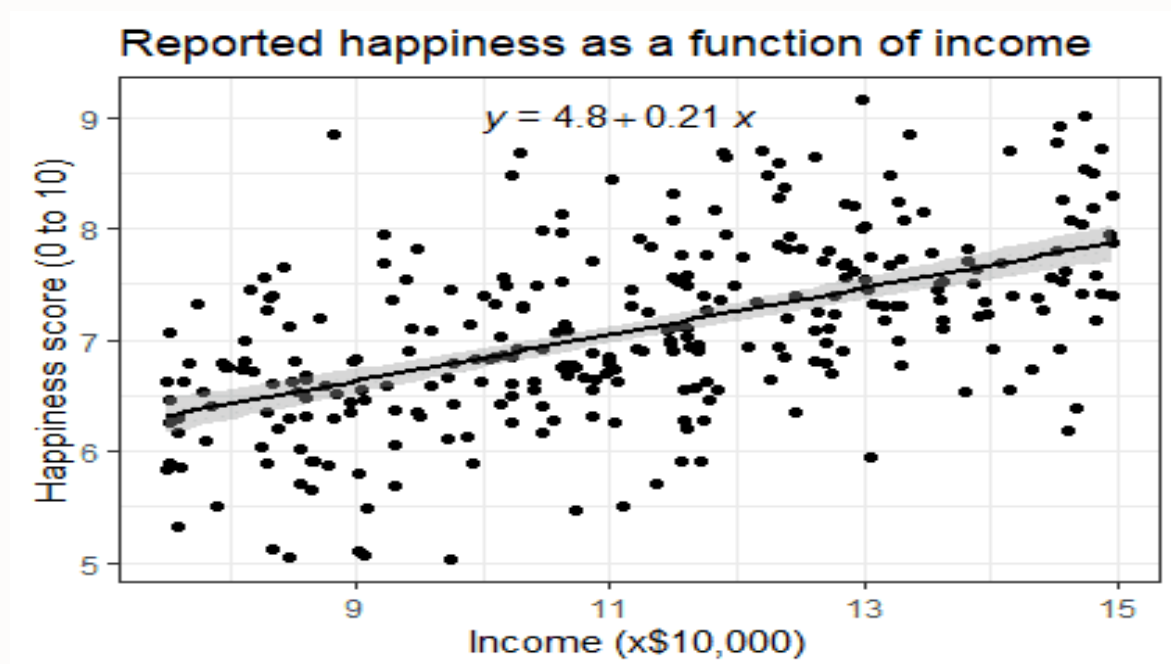
We found a significant relationship ($p < 0.001$) between income and happiness ($R^2 = 0.71 \pm 0.018$), with a 0.71-unit increase in reported happiness for every 10,000 increase in income. It can also be helpful to include a graph with your results. For a simple linear regression, you can simply plot the observations on the *x* and *y* axis and then include the regression line and regression function:



Can you predict values outside the range of your data?

No! We often say that regression models can be used to **predict** the value of the dependent variable at certain values of the independent variable. However, this is only true for the range of values where we have actually measured the response.

We can use our income and happiness regression analysis as an example. Between 15,000 and 75,000, we found an r^2 of 0.73 ± 0.0193 . But what if we did a second survey of people making between 75,000 and 150,000?



The r^2 for the relationship between income and happiness is now 0.21, or a 0.21-unit increase in reported happiness for every 10,000 increase in income. While the relationship is still statistically significant ($p < 0.001$), the slope is much smaller than before.

What if we hadn't measured this group, and instead extrapolated the line from the 15–75k incomes to the 70–150k incomes?

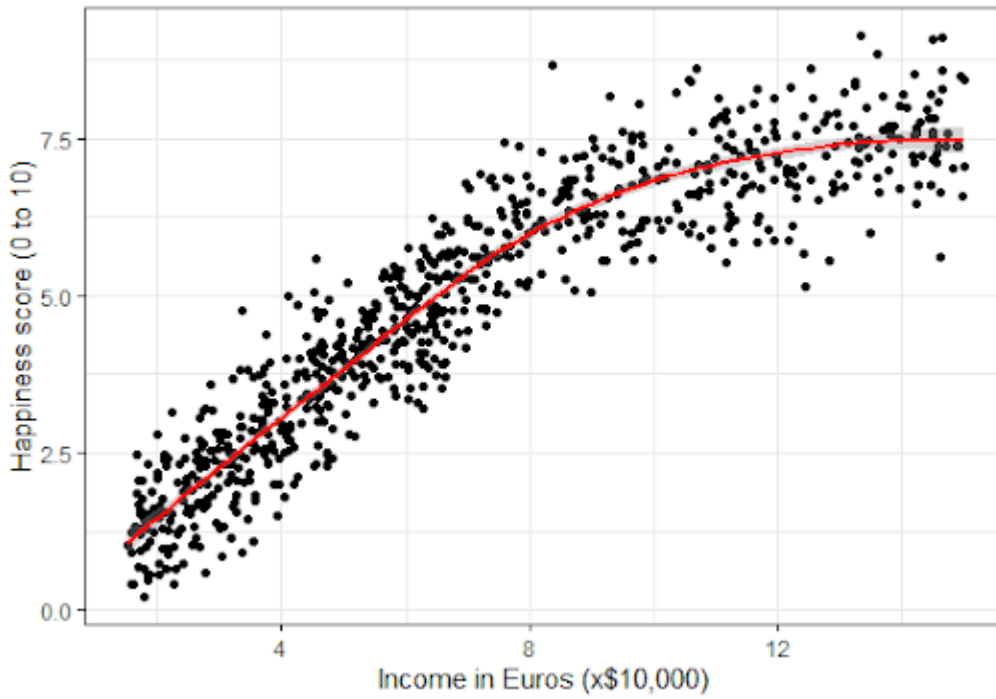
You can see that if we simply extrapolated from the 15–75k income data, we would overestimate the happiness of people in the 75–150k income range.

If we instead fit a curve to the data, it seems to fit the actual pattern much better.

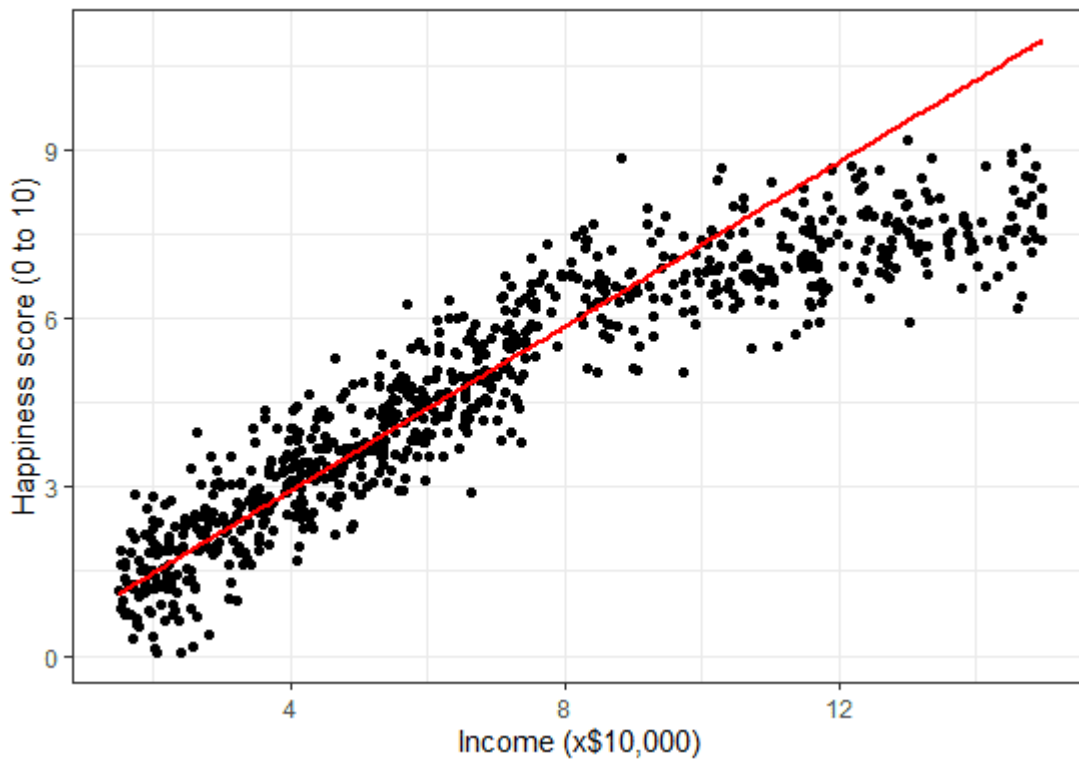
It looks as though happiness actually levels off at higher incomes, so we can't use the same regression line we calculated from our lower-income data to predict happiness at higher levels of income.

Even when you see a strong pattern in your data, you can't know for certain whether that pattern continues beyond the range of values you have actually measured. Therefore, it's important to avoid extrapolating beyond what the data actually tell you.

Reported happiness as a function of income



Reported happiness as a function of income



Sales forecasting is important because it can help you identify what is going right, as well as what areas of your current strategy need to be adapted and changed to ensure future success.

For example, if your team is consistently below quotas, sales forecasting can help determine where and why these issues are happening. Forecasting can also help you decide on future business endeavours, like when you'd have the revenue to invest in new products or expand your business.

Some forecasting methods involve doing basic math, like adding up month to month sales, and others are more in-depth. Regression analysis is one of these methods, and it requires in-depth statistical analysis.

If you're anything like me and not at all mathematically inclined, conducting this type of forecast may seem daunting. Thankfully, this piece will give an easy to understand breakdown of regression analysis in sales and guide you through an easy to follow example using [Google Sheets](#).

What is regression analysis?

In statistics, regression analysis is a mathematical method used to understand the relationship between a dependent variable and an independent variable. Results of this analysis demonstrate the strength of the relationship between the two variables and if the dependent variable is significantly impacted by the independent variable.

There are multiple different types of regression analysis, but the most basic and common form is simple linear regression that uses the following equation: $Y = bX + a$

That type of explanation isn't really helpful, though, if you don't already have a grasp of mathematical processes, which I certainly don't. Let's take a look at what regression analysis means, in layman's terms, for sales forecasting.

Independent and dependent variables are still at play here, but the dependent variable is always the same: sales performance. Whether it's total revenue or number of deals closed, your dependent variable will always be sales performance. The independent variable is the factor you are examining that will change sales performance, like the number of salespeople you have or how much money is spent on advertising.

Sales regression forecasting results help businesses understand how their sales teams are or are not succeeding and what the future could look like based on past sales performance. The results can also be used to predict future sales based on changes that haven't yet been made, like if hiring more salespeople would increase business revenue.

So, what do these words mean, math wise? Like I said before, I'm not good at math. But, I did conduct a simple sales regression analysis that is easy to follow and didn't require many calculations on my part. Let's go over this example below.

How to Use Regression Analysis to Forecast Sales

Let's say that you want to run a sales forecast to understand if having your salespeople make more sales calls will mean that they close more deals. To conduct this forecast, you need historical data that depicts the number of sales calls made over a certain period. So, mathematically, the number of sales calls is the independent variable, or X value, and the dependent variable is the number of deals closed per month, or Y value.

I made up the data set below to represent monthly sales calls, and a corresponding number of deals closed over a two-year period.

fx			
	A	B	C
1	Sales Period	Sales Calls - X	Deals Closed - Y
2	January 2019	20	50
3	February 2019	20	30
4	March 2019	40	60
5	April 2019	10	30
6	May 2019	30	70
7	June 2019	10	40
8	July 2019	30	60
9	August 2019	20	40
10	September 2019	30	60
11	October 2019	10	40
12	November 2019	20	30
13	December 2019	30	70
14	January 2020	20	30
15	February 2020	40	60
16	March 2020	20	40
17	April 2020	30	60
18	May 2020	10	30
19	June 2020	10	40
20	July 2020	20	40
21	August 2020	20	50
22	September 2020	20	30
23	October 2020	30	70
24	November 2020	20	50

So, the overall regression equation is $Y = bX + a$, where:

- X is the independent variable (number of sales calls)
- Y is the dependent variable (number of deals closed)
- b is the slope of the line
- a is the point of interception, or what Y equals when X is zero

Since we're using Google Sheets, its built-in functions will do the math for us and we don't need to try and calculate the values of these variables. We simply need to use the historical data table and select the correct graph to represent our data. The first step of the process is to highlight the numbers in the X and Y column and navigate to the toolbar, select Insert, and heets tool did the math for me, but the line in the chart is the b variable from the regression equation, or slope, that creates the line of best fit. The blue dots are the y values, or the number of deals closed based on the number of sales calls.

values, or the number of deals closed based on the number of sales calls.

So, the scatter plot answers my overall question of whether having salespeople make more sales calls will close more deals. The answer is yes, and I know this because the line of best fit trendline is moving upwards, which indicates a positive relationship. Even though one month can have 20 sales calls and 10 deals and the next has 10 calls and 40 deals, the statistical analysis of the historical data in the table assumes that, on average, more sales calls means more deals closed.

I'm fine with this data. It means that simply having salespeople make more calls per-month than they have before will increase deal count. However, this scatter plot does not give us the specific forecast numbers that you'll need to understand your future sales performance. Let's use the same example to obtain that information.

Let's say your boss tells you that they want to generate more quarterly revenue, which is directly related to sales activity. You can assume closing more deals means generating more revenue, but you still want the data to prove that having your salespeople make more calls would actually close more deals.

The built-in FORECAST.LINEAR equation in Sheets will help you understand this, based on the historical data in the first table.

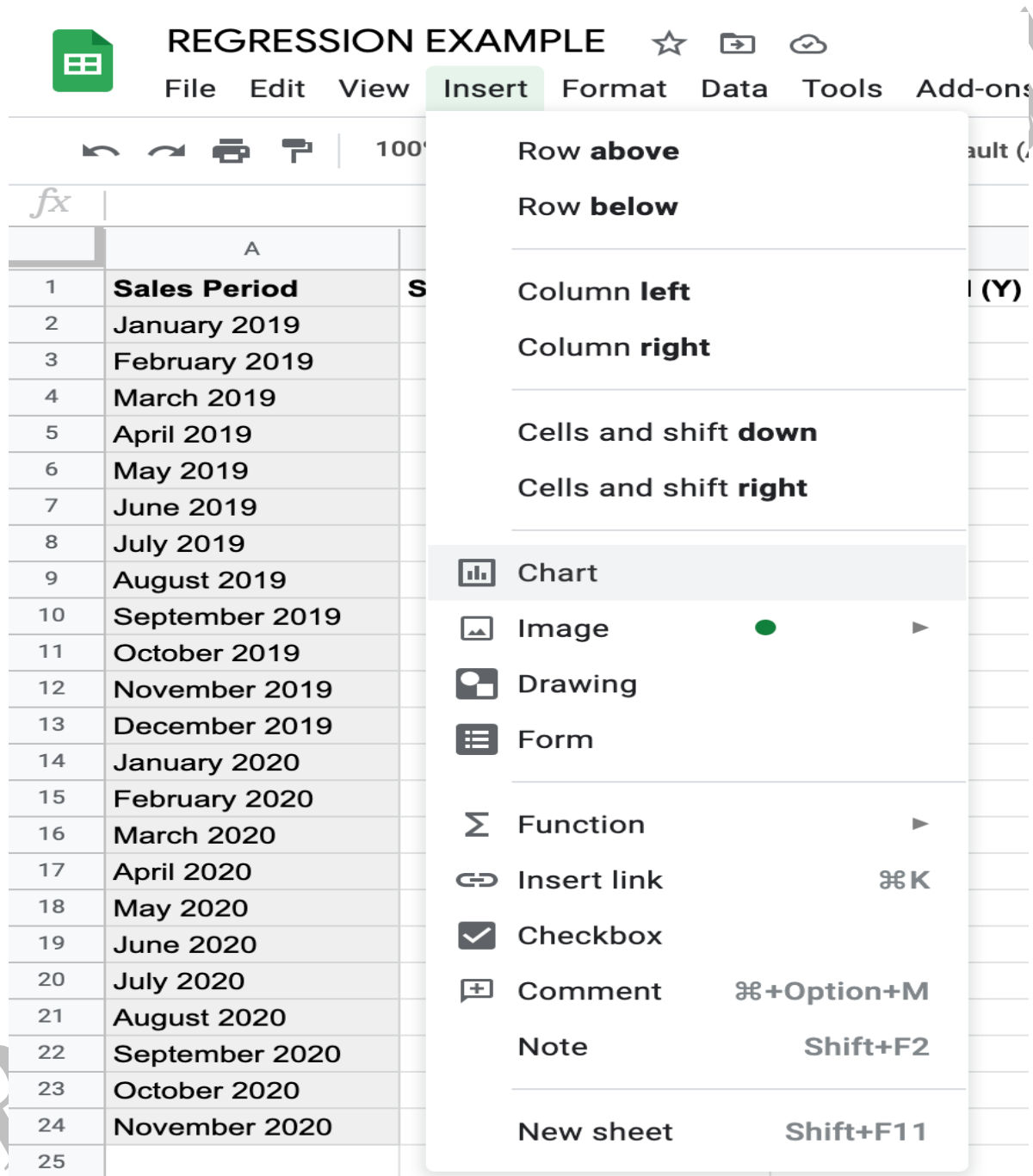
I made the table below within the same sheet to create my forecast breakdown. In my Sheets document, this new table uses the same columns as the first (A, B, and C) and begins in row 26.

I went with 50 because the highest number of sales calls made in any given month from the original data table is 40 and we want to know what happens to deal totals if that number actually increases. I could've only used 50, but I increased the number by 10 each month to get an accurate forecast that is based on statistics, not a one-off occurrence.

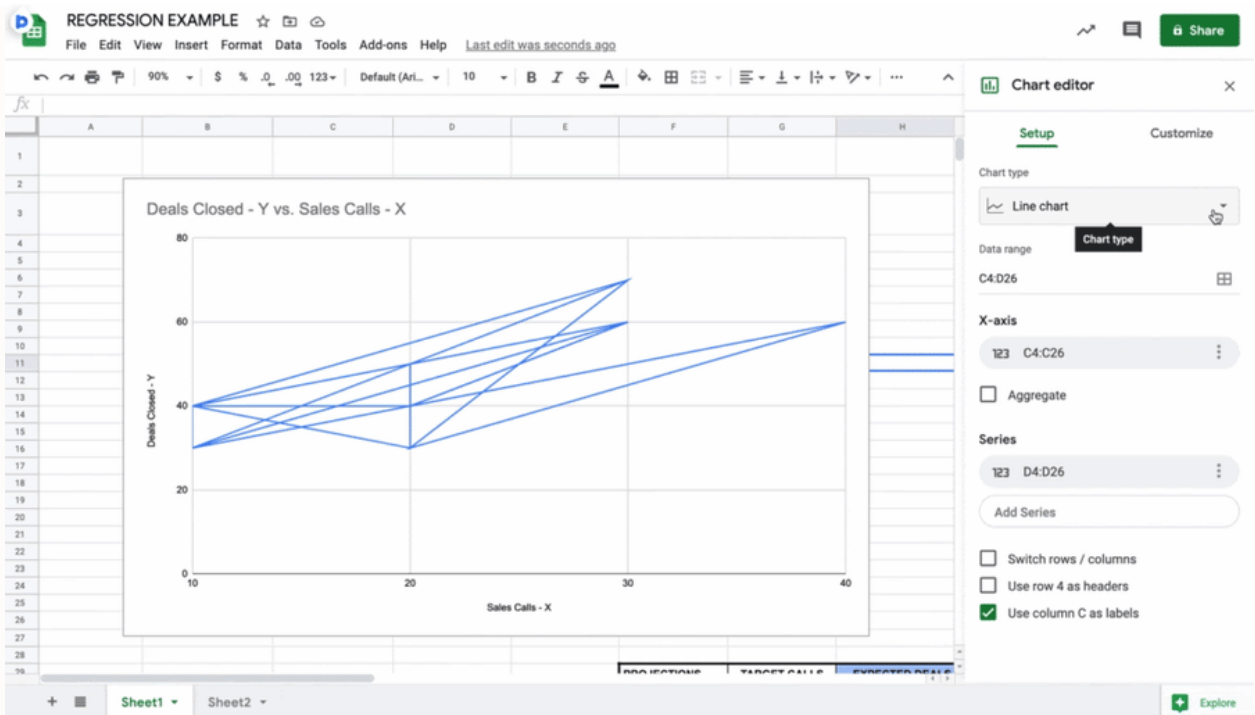
26	SALES PERIOD	TARGET CALLS	FORECAST
27	December 2020	50	
28	January 2021	60	
29	February 2021	70	
30	March 2021	80	
31	April 2021	90	
32	May 2021	100	

After creating this chart, I followed this path within the Insert dropdown menu in the Sheets toolbar: Insert -> Function -> Statistical -> FORECAST.LINEAR.

This part gets a little bit technical, but it's simpler than it looks. The instruction menu below tells me that I'll obtain my forecasts by filling in the relevant column numbers for the target number of sales calls.

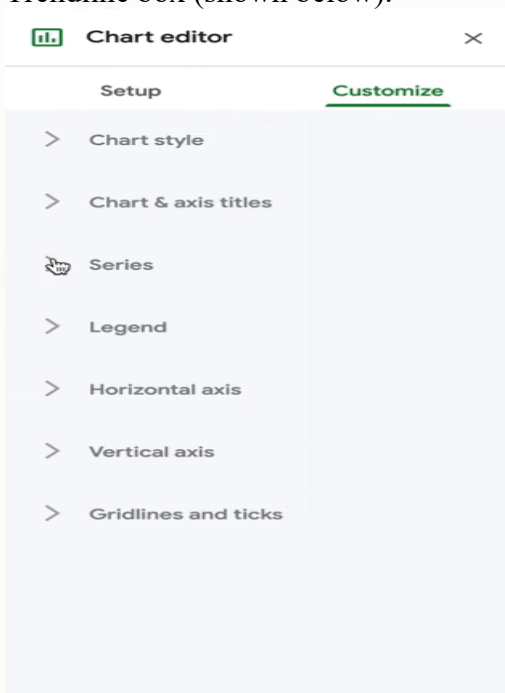


The default graph that appears isn't what we need, so I clicked on the Chart editor tool and selected Scatter plot, as shown in the gif below.



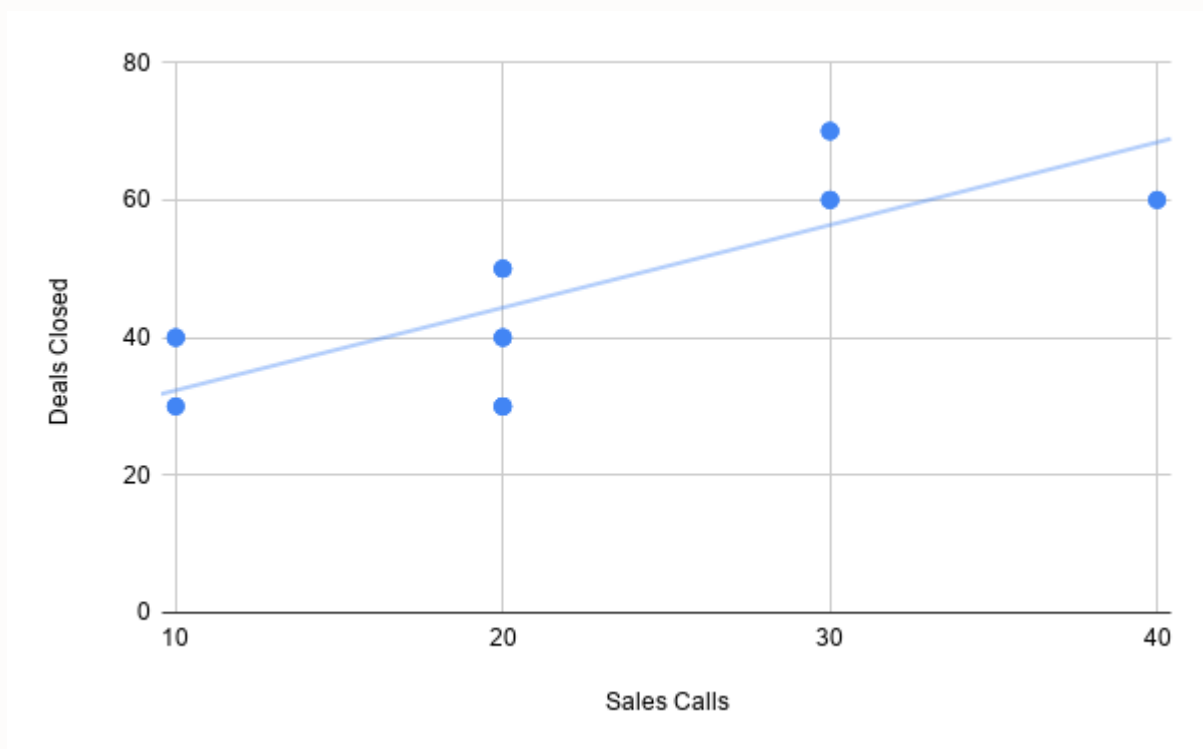
Link - <https://rb.gy/13w65>

After selecting the scatter plot, I clicked Customize, Series, and scrolled down to select the Trendline box (shown below).



<https://rb.gy/13w65>

After all of these customizations, I get the following scatter plot.



The Sheets tool did the math for me, but the line in the chart is the b variable from the regression equation, or slope, that creates the line of best fit. The blue dots are the y values, or the number of deals closed based on the number of sales calls.

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I'm fine with this data. It means that simply having salespeople make more calls per-month than they have before will increase deal count. However, this scatter plot does not give us the specific forecast numbers that you'll need to understand your future sales performance. Let's use the same example to obtain that information.

Let's say your boss tells you that they want to generate more quarterly revenue, which is directly related to sales activity. You can assume closing more deals means generating more revenue, but you still want the data to prove that having your salespeople make more calls would actually close more deals.

The built-in FORECAST.LINEAR equation in Sheets will help you understand this, based on the historical data in the first table.

I made the table below within the same sheet to create my forecast breakdown. In my Sheets document, this new table uses the same columns as the first (A, B, and C) and begins in row 26.

I went with 50 because the highest number of sales calls made in any given month from the original data table is 40 and we want to know what happens to deal totals if that number actually increases. I could've only used 50, but I increased the number by 10 each month to get an accurate forecast that is based on statistics, not a one-off occurrence.

sample data for regression sales forecasting

After creating this chart, I followed this path within the Insert dropdown menu in the Sheets toolbar: Insert -> Function -> Statistical -> FORECAST.LINEAR.

This part gets a little bit technical, but it's simpler than it looks. The instruction menu below tells me that I'll obtain my forecasts by filling in the relevant column numbers for the target number of sales calls.

Here is the breakdown of what the elements of the FORECAST.LINEAR equation mean:

x is the value on the x-axis (in the scatter plot) that we want to forecast, which is the target call volume.

data_y uses the first and last row number in column C in the original table, 2 and 24.

data_x uses the first and last row number in column B in the original table, 2 and 24.

data_y goes before data_x because the dependent variable in column C changes because of the number in column B.

This equation, as the FORECAST.LINEAR instructions tell us, will calculate the expected y value (number of deals closed) for a specific x value based on a linear regression of the original data set. There are two ways to fill out the equation. The first option, shown below, is to manually input the x value for the number of target calls and repeat for each row.

=FORECAST.LINEAR(50, C2:C24, B2:B24)

The second option is to use the corresponding cell number for the first x value and drag the equation down to each subsequent cell. This is what the equation would look like if I used the cell number for 50 in the second data table:

=FORECAST.LINEAR(B27, C2:C24, B2:B24)

To reiterate, I use the number 50 because I want to be sure that making more sales calls results in more closed deals and more revenue, not just a random occurrence. This is what the number of deals closed would be, not rounded up to exact decimal points.

Overall, the results of this linear regression analysis and expected forecast tell me that the number of sales calls is directly related to the number of deals closed per month. If you ask your salespeople to make ten more calls per month than the previous month, the number of deals closed will increase, which will help your business generate more revenue.

While Google Sheets helped me do the math without any further calculations, other tools are available to streamline and simplify this process.

Sales Regression Forecasting Tools

A critical factor in conducting a successful regression analysis is having data and having enough data. While you can add and just use two numbers, regression requires enough data to determine if there is a significant relationship between your variables. Without enough data

points, it will be challenging to run an accurate forecast. If you don't yet have enough data, it may be best to wait until you have enough.

Once you have the data you need, the below list of tools that can help you through the process of collecting, storing, and exporting your sales data.

InsightSquared

InsightSquared is a revenue intelligence platform that uses AI to make accurate forecasting predictions.

While it can't run a regression analysis, it can give you the data you need to conduct the regression on your own. Specifically, it provides data breakdowns of the teams, representatives, and sales activities that are driving the best results. You can use this insight to come up with further questions to ask in your regression analysis to better understand performance.

MethodData

Since sorting through data is essential for beginning your analysis, MethodData is a valuable tool. The service can create custom sales reports based on the variables you need for your specific regression, and the automated processes save you time. Instead of digging through your data and cleaning it up enough to be usable, it happens automatically once you create your custom reports.

HubSpot Sales Hub

HubSpot's Sales Hub automatically records and tracks all relevant sales and performance data related to your teams. Specific items collected include activity reports for sales calls, emails sent, and meetings taken with clients, but you can also create custom reports.

What is multiple linear regression?

Multiple linear regression is a regression model that estimates the relationship between a quantitative dependent variable and two or more independent variables using a straight line.

Estimating Demand Curve

In economics, a demand curve represents the relationship between the quantity of a product demanded and its price. It is almost always downward-sloping, as more people are willing to buy the product as it becomes cheaper. For a given product, a demand curve may be estimated by first conducting a survey and then performing a regression analysis. A demand curve helps small business owners decipher which price is most suitable for their products. Obtain the data needed for your calculation. Data regarding consumer demand may be obtained from creating a survey. Such surveys ask members of the general public whether they are willing to purchase a certain product at a certain price. Some people are willing to pay a higher price for a product, whereas others are willing to buy it only at a lower price. This results in a set of data in which you will have a given number of consumers who are willing to pay at each price. For example: Five people will buy at \$5, seven people will buy at \$4, 12 people will buy at \$3, and so on. Such data should be new and have a high sample size. You may conduct these surveys in your place of business.

Format your data into a spreadsheet. One column contains information regarding price, and the other column contains how many people are willing to buy the product at the respective price. Graph your data in the form of a scatter plot. The demand curve requires that price is on the y-axis and quantity, or in this case, number of people, is on the x-axis. The functions used for creating a scatter plot vary by spreadsheet program, but your final graph should resemble a series of dots in an empty field.

Perform a regression analysis of your data. Most spreadsheets have this function, but the specific method of performing the function varies by program. A regression estimates a line that best fits your scatter plot. When the regression is complete, you should have a linear equation that represents a straight line with a y-intercept and a slope. The slope represents customer sensitivity to increases in prices, and thus shows how much demand will fall upon an increase in price. You can use the demand curve to estimate how many people are willing to purchase your goods at a certain price.

What Is the Demand Curve?

The demand curve is a graphical representation of the relationship between the price of a good or service and the quantity demanded for a given period of time. In a typical representation, the price appears on the left vertical axis while the quantity demanded is on the horizontal axis.

A demand curve doesn't look the same for every product or service. When the price rises, demand generally falls for almost any good, but the drop is much greater for some goods than for others. This reflects the price elasticity of demand, a measurement of the change in consumption of a product in relation to a change in its price. The elasticity of demand for products varies between and within product categories, depending on the product's substitutability.

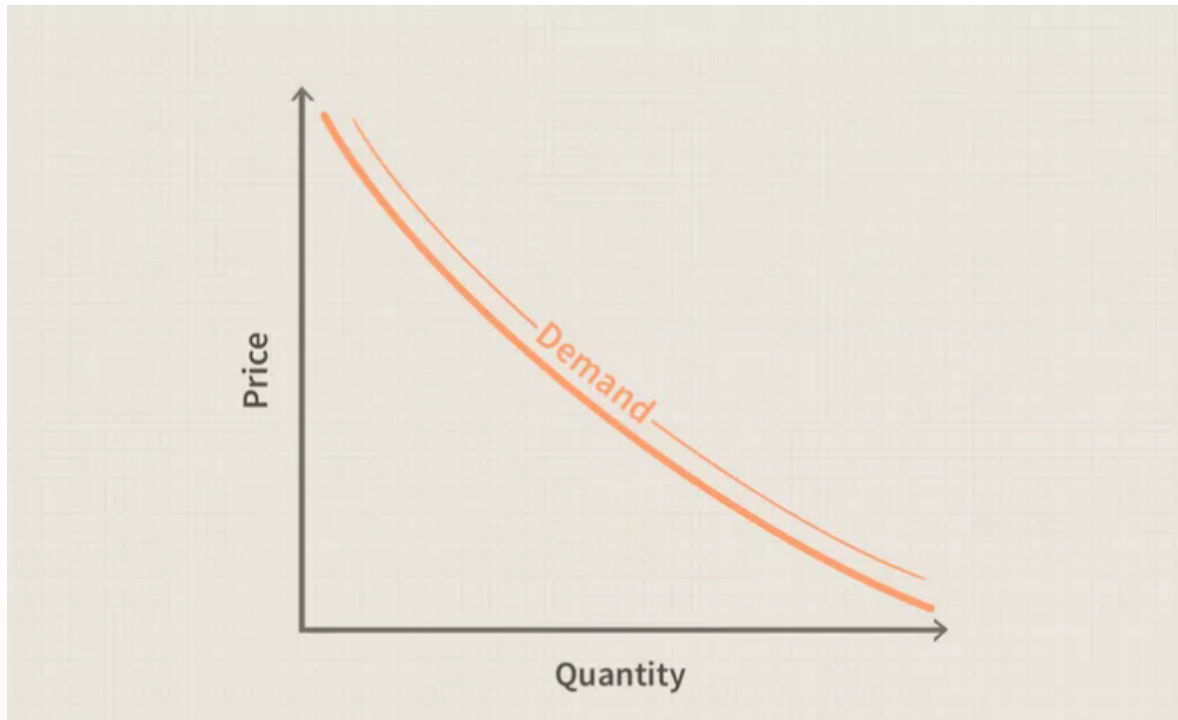
Understanding the Demand Curve

As noted above, the demand curve is a commonly used graph that represents the relationship between prices and the total quantity of goods and services demanded over a certain period of time. Prices normally appear on the y-axis while demand is depicted on the x-axis.

This curve generally moves downward from the left to the right. This movement expresses the law of demand, which states that as the price of a given commodity increases, the quantity demanded decreases as long as all else is equal.

Note that this formulation implies that price is the independent variable, and quantity is the dependent variable. In most disciplines, the independent variable appears on the horizontal or x-axis, but economics is an exception to this rule.

For example, if the price of corn rises, consumers will have an incentive to buy less corn and substitute other foods for it, so the total quantity of corn that consumers demand will fall.



What is price bundling?

Price bundling (product bundling or product-bundle pricing) is a marketing strategy that combines two or more products to sell them at a lower price than if the same products were sold individually. The bundle pricing technique is popular in retail and eCommerce as it offers more value for the price. It can also help build customer loyalty and boost product sales. Price bundling can be applied to any type of product, but it works best when there are two or more items in the bundle. For example, say you own an ice cream shop and want to offer customers deals on their favorite flavors. You could offer a bundle of three ice cream cones for \$4 instead of selling them each at \$1 each.

Common bundle pricing examples

Bundle pricing examples can be seen in many industries. The strategy is used to entice potential customers to purchase additional products or services that companies know will be valuable. You've likely seen the following real-life bundle pricing examples:

- Mobile devices sold with a data plan
- Microsoft Office 365 and G Suite
- Soup, salad, and breadsticks

In each of these bundle pricing examples, the customer is able to purchase everything they need at a single price, whether it's software tools or dinner. The company selling these products provides more value in a single purchase than if each item in the product bundle

were purchased separately. Think about it: your phone would be less useful without a data plan, and breadsticks really tie a meal together.

When is a price bundling strategy right for your business?

Bundle pricing strategy is great to use when you have a suite of products or services to offer, or when you want to increase the value of low-volume items. Selling these complementary products together gives customers the functionality they need to get the most value out of your service or product. Bundle pricing strategy makes customers' purchase experiences better and can lead to more engaged customers over time.

Your product has necessary integrations

In today's interconnected SaaS and subscription market, certain types of services are built on top of existing functionality to increase value or facilitate integration. When your product requires these types of connections to function properly, price bundling makes it easy to provide every new customer with the functionality they need in a single purchase. There are lots of bundle pricing examples of this in subscription billing platforms, which bundle subscription management with additional features, such as payment gateways, analytics, and revenue recognition.

You need to offer discounts for certain products

Whether it's a new competitor that's eating up your customer base or it's a lack of engagement from existing users, there are times when offering a discount is a necessary part of doing business. While actively discounting products can chip away at their perceived value, price bundling helps you offset these negative effects by combining discounted products together. This helps you capture more revenue for each individual purchase and increases the value add for the customer.

When you're considering price bundling, it's important to understand how customers derive value from every part of your business. If you bring together products that don't increase in value as a bundle, it could drive down sales.

Two types of price bundling

Price bundling falls into two broad categories: pure bundling and mixed bundling. Within pure bundling, there are two subcategories based on how customers get value from different products or features.

Pure bundling

Pure bundling takes place when a customer only has the choice to purchase the bundle as-is or not at all. This type of price bundling is simplest to accomplish, because the creation of a bundle is entirely controlled by you. Joint bundling and leader bundling look at the different features in your bundle and how they work together.

Joint bundling

Joint bundling is the process of offering two or more products together for a single price. The products can be obtained only through a single purchase. G Suite is an example of this because you don't have the ability to purchase Gmail or Sheets as a stand-alone product.

Leader bundling

Similar to joint bundling, leader bundling is the process of offering two or more products together for a single price. The difference is that, in this bundle, one product is inherently more valuable and is therefore referred to as a "leader" product.

Mixed bundling

Mixed bundling isn't as strict as pure bundling. When you create a mixed bundle, you're giving customers the option to purchase each feature together, or individually for a higher price. Microsoft Office 365 offers mixed bundles as well as the ability to purchase stand-alone instances of either Excel or PowerPoint.

Advantages of bundle pricing

Price bundling helps you overcome the difficulty of getting potential customers to make a purchase of specific products or services. It simplifies their buying experience and can potentially increase average order values through the combination of high-value and low-value products.

Simplify the buying experience

When you offer a bundle of normally separated products or features that, together, your customers need to accomplish their goals, you make the purchase decision easier. Instead of expecting them to cobble together different products or features, you're offering a one-stop shop for them. That makes the experience of interacting with your business and purchasing your product simple and efficient.

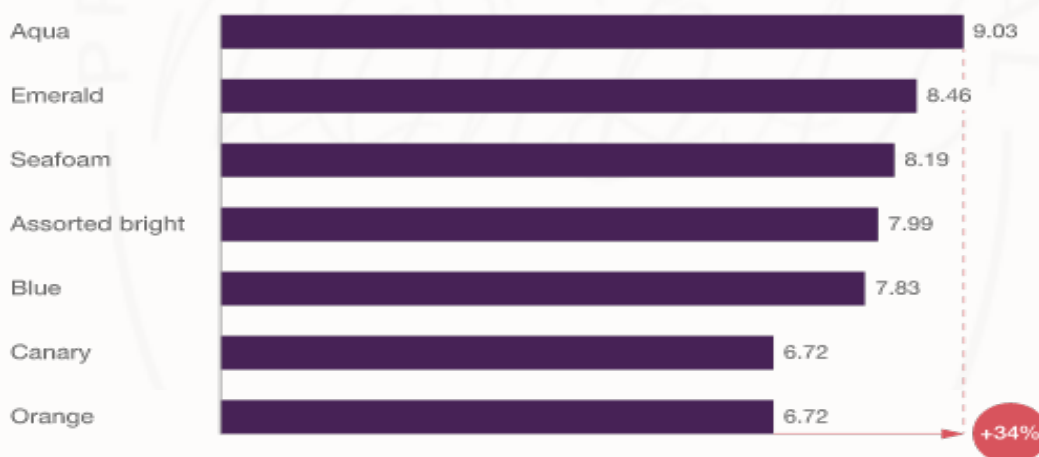
Increase sales

Bundling is a great way to increase your sales and profit margins as well as the value you provide to customers. We see this in companies like Amazon, which often create dynamic product bundles based on complementary products their customers typically purchase. This allows Amazon to create larger margins for themselves while also offering a lower price than their competitors.

Let's take a look at an example with sticky notes of different colors. When a customer purchases orange sticky notes for \$6.72, Amazon can bundle those together with aqua sticky notes for \$9.03.

Through bundled pricing, Amazon achieves a higher margin on related products.

Sticky note pricing,¹ \$



¹Prices dated October 23, 2017.

McKinsey&Company | Source: Amazon.com

This results in a 34% markup from the customer's intended purpose, helping Amazon tap into more revenue through the bundle while still offering a low price for orange sticky notes. With a bundle pricing strategy, you're not just putting together products that complement one another from a business perspective; you're also giving customers more value through the

bundle than they would receive from each individual purchase. That compounding value makes customers more loyal and can lead to future purchases.

Move lower-volume products

If you have a product or feature that's underperforming, price bundling helps you boost customer engagement by selling it alongside a more popular one. Just make sure that both of the products you're bundling together increase in value as a result of the bundle. You don't want to decrease the value of a more popular product or feature by connecting it with one that your customers don't actually need.

Disadvantages of bundle pricing

The benefits of price bundling outweigh the disadvantages, but it's still important to understand how a bundle pricing strategy affects your customers. If you're not careful, you may actually be decreasing the value of certain products or services by bundling them together with others that aren't as useful for potential customers.

Customers may prefer to buy separately

There will always be customers who want to make their own decisions. When you bundle different products or services together, you're taking the element of choice away. Doing so can potentially have a negative effect on the customer experience if you're working in an industry where customers have more purchasing power. Consider how the bundle you're creating adds value not only for your business but for your customers as well.

Customers may not need all the bundled products

A solid bundle price strategy is predicated on how much value you're adding for the customer, for the specific products or features, and for your business. It's important to make sure that you're always fulfilling an actual need of your target buyer personas. Customers who don't need certain features will feel like they're unnecessarily paying for something and will seek out other options.

Price bundling helps you provide more value to customers

When you bundle the right features or products together, you not only make it easier for customers to make a purchase but also give them more value for a single purchase than if they were to buy individual products. That creates a more engaged and loyal customers base that's primed to make an additional purchase down the line.

If you need help creating your bundles, Profit Well's tools and expert pricing strategists will help you identify which products or features are the most ideal for bundling. They will help you determine the optimal price for any bundle and will share best practices for how to use bundling to grow your business.

What are price bundling examples?

When price bundling, companies will sell two products together at a lower price than the sum of the individual price of each product. Common bundle pricing examples are cable TV and mobile plans and fast food restaurant value meal combos.

What's the benefit of price bundling?

Price bundling offers customers a bigger perceived value per purchase. Offering customers package deals is a good way to build goodwill when they purchase a new product.

How do I decide which products to bundle?

Deciding which products to bundle depends on how well the two products work together. Typically, brands will bundle products that are complementary or related to each other so that customers will feel like they are getting a deal when purchasing a bundle.

Why is bundle pricing strategy good for your revenue?

Price bundling is a good revenue strategy because it increases your net sales upfront by simplifying the buying experience for your customer. By bundling relevant products as a package, you are positioning your product to offer more value per purchase to your customer and building brand loyalty through product adoption.

What is Non-Linear Pricing? Definition

Non-linear pricing is a type of pricing strategy where the price of a product or service is not based on a linear scale. In other words, the price is not directly proportional to the quantity of the product or service purchased. This type of pricing is often used in cases where there are fixed costs associated with production, such as with manufactured goods. Non-linear pricing can also be used to encourage customers to purchase more of a product or service, by offering discounts for larger quantities purchased.

What is Non-Linear Pricing?

Non-linear pricing is a pricing strategy in which the price of a product or service is not proportional to the quantity of the product or service purchased. This means that the price of a product or service can vary significantly based on factors such as demand, production costs, and availability. Non-linear pricing can be used to encourage customers to purchase more of a product or service, or to discourage them from purchasing too much.

There are two main types of non-linear pricing:

1. Variable pricing – This is where the price of a product or service varies according to demand. For example, hotels often charge higher prices during peak periods when demand is high.

2. Tiered pricing – This is where different products or services are priced differently based on their features or quality. For example, luxury cars are typically priced higher than economy cars.

How Non-Linear Pricing Works

Non-linear pricing is a type of pricing strategy where the price of a product or service is not directly proportional to the quantity purchased. In other words, as the quantity increases, the price may stay the same or even decrease. This type of pricing can be used to encourage customers to buy more of a product or service.

There are many different ways that non-linear pricing can work. For example, a company might offer a discount when a customer buys multiple units of a product. Or, a company might charge different prices depending on how much of a product is used. Non-linear pricing can also be tiered, so that different prices are charged for different levels of consumption.

Benefits of non-linear pricing include encouraging customers to buy more, increasing profits, and simplifying price structures. Additionally, non-linear pricing can help companies better match their prices to customer demand.

Drawbacks of non-linear pricing include the potential for confusion among customers and the need for careful planning to make sure that the strategy is effective. Additionally, non-linear pricing may not always be ethical if it results in customers paying more than they would under a linear pricing structure.

Pros and Cons of Non-Linear Pricing

PROS:

1. Non-linear pricing can be used to encourage customers to purchase a product during off-peak hours, when demand is lower. This can help businesses to better utilize their resources and capacity.
2. Non-linear pricing can also be used to incentivize customers to purchase larger quantities of a product, which can lead to economies of scale for the business.
3. In some cases, non-linear pricing can lead to increased revenue for the business as customers are willing to pay more for the convenience or perceived value of the product.

CONS:

1. Non-linear pricing can be confusing for customers, who may not be aware of the different price points for different times or quantities of the product. This could lead to frustration and decreased customer satisfaction.
2. If not managed properly, non-linear pricing could lead to decreased profits for the business as customers purchase during off-peak hours or in larger quantities than what the business had anticipated.

Case Studies of Non-Linear Pricing

Non-linear pricing is a type of pricing strategy where the price of a product or service is not directly proportional to the quantity demanded. In other words, the price does not increase linearly with increased demand. This type of pricing strategy is often used by businesses to encourage customers to purchase more products or services, or to discourage them from purchasing too much.

There are many different types of non-linear pricing strategies, and businesses often use a combination of several strategies to maximize their profits. Some common examples of non-linear pricing strategies include bulk discounts, tiered pricing, and demand-based pricing.

Bulk Discounts: Bulk discounts are a type of non-linear pricing where the unit price of a product decreases as the quantity purchased increases. This type of discount encourages customers to purchase more products in order to get a lower price per unit. Bulk discounts are often used for consumable goods such as food and beverage items.

Tiered Pricing: Tiered pricing is a type of non-linear pricing where there are multiple price points for different levels of consumption. For example, a business might charge different prices for different quantities of a product, with the price per unit decreasing as the quantity purchased increases. Tiered pricing can be used to encourage customers to purchase more products or services, or to discourage them from consuming too much.

Demand-Based Pricing: Demand-based pricing is a type of non-linear pricing where prices fluctuate based on customer demand.

Conclusion

Non-linear pricing is a type of pricing strategy that's becoming increasingly popular with businesses. It involves charging different prices for the same product or service, based on factors like time, location, or customer. While it can be complicated to implement, non-linear pricing can be a great way to maximize profits and tailor your offerings to your customers' needs.

What Is Price Skimming?

Price skimming is a product pricing strategy by which a firm charges the highest initial price that customers will pay and then lowers it over time. As the demand of the first customers is satisfied and competition enters the market, the firm lowers the price to attract another, more price-sensitive segment of the population.

The skimming strategy gets its name from "skimming" successive layers of cream, or customer segments, as prices are lowered over time.

How Price Skimming Works

Price skimming is often used when a new type of product enters the market. The goal is to gather as much revenue as possible while consumer demand is high and competition has not entered the market.

Once those goals are met, the original product creator can lower prices to attract more cost-conscious buyers while remaining competitive toward any lower-cost copycat items entering the market. This stage generally occurs when sales volume begins to decrease at the highest price the seller is able to charge, forcing them to lower the price to meet market demand.

This approach contrasts with the penetration pricing model, which focuses on releasing a lower-priced product to grab as much market share as possible. Generally, this technique is better-suited for lower-cost items, such as basic household supplies, where price may be a driving factor in most customers' production selections.

- Firms often use skimming to recover the cost of development. Skimming is a useful strategy in the following contexts:
- There are enough prospective customers willing to buy the product at a high price.
- The high price does not attract competitors.
- Lowering the price would have only a minor effect on increasing sales volume and reducing unit costs.
- The high price is interpreted as a sign of high quality.

When a new product enters the market, such as a new form of home technology, the price can affect buyer perception. Often, items priced towards the higher end suggest quality and exclusivity. This may help attract early adopters who are willing to spend more for a product and can also provide useful word-of-mouth marketing campaigns.

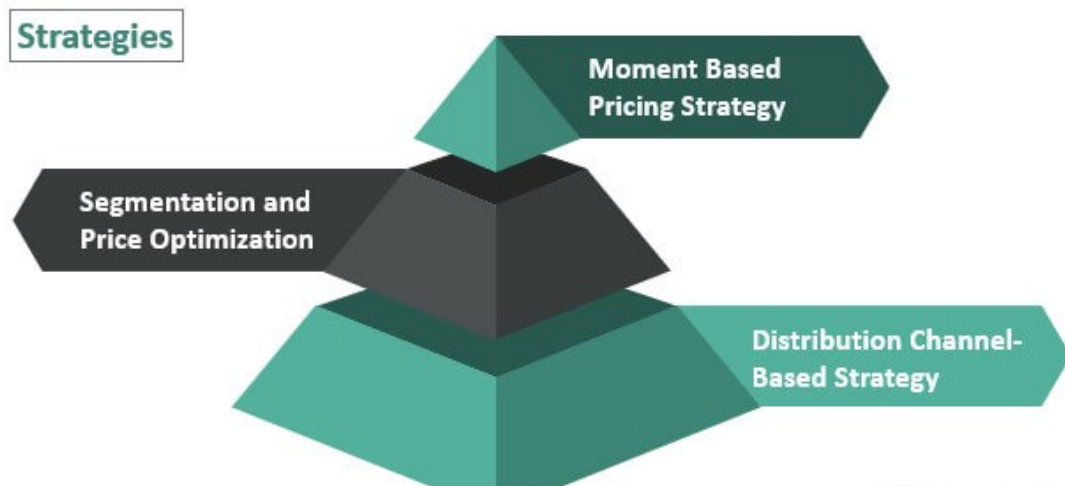
Price Skimming Limits

Generally, the price skimming model is best used for a short period of time, allowing the early adopter market to become saturated, but not alienating price-conscious buyers over the long term. Additionally, buyers may turn to cheaper competitors if a price reduction comes about too late, leading to lost sales and most likely lost revenue. Price skimming may also not be as effective for any competitor follow-up products. Since the initial market of early adopters has been tapped, other buyers may not purchase a competing product at a higher price without significant product improvements over the original.

What is Revenue Management?

Revenue Management is a disciplined analytics technique used to predict consumer behaviour at the micro-level, which is used to optimize product availability and pricing and maximize revenue growth. In other words, the primary objective is to sell the right product at the right price to the right customer at the right time.

Revenue Management



Examples

Example #1

Let us take the example of a hotel during the festive season. Typically, all the hotels located in the vicinity of the festival venue increase their room prices to a much higher level than those located away from the venue. It is an example of seasonal pricing using the revenue management technique.

Example #2

Let us take the example of an exclusive discount offer at a restaurant. Based on available data, the restaurant owner realized that they don't have meagre Thursday traffic. So, he decided to launch a new offer of a 25% discount for diners on Thursdays. It helped him to attract more diners on that particular day of the week. It is an example of promotions & discounts using the revenue management technique.

Example #3

Let us take the example of dynamic pricing

used in airline ticket sales during peak season. The airline industry typically offers flight tickets at a hiked-up rate during summer, as people love traveling during that time. Again the same tickets are offered at a reduced rate during the offseason. It is also an example of seasonal pricing using the revenue management technique.

Strategies of Revenue Management

#1 – Segmentation and Price Optimization

The customers are classified into different segments based on various criteria. After that, each segment has to be analyzed separately to understand customer behavior in each segment; their preference in terms of pricing and product features. Then different pricing strategies and marketing strategies are built to approach the different customer segments.

#2 – Moment Based Pricing Strategy

The right strategy must be selected for pricing strategies, keeping in mind the current situation. For instance, discounts make sense when the demand is weak, while pricing may be kept higher when the demand is high, and the seller adopts a value-added approach.

#3 – Distribution Channel-Based Strategy

Using the right

distribution channel

to find the right set of customers while reaching as many customers as possible is important.

The strategy's priority should be to reduce the number of intermediaries to pass the benefit of a lower commission fee on to the customers in the form of lower pricing.

Why it's Important?

All businesses have fixed overheads. These need to be incurred irrespective of the level of business operations

and the corresponding revenue

. In such a scenario, revenue management can come handy as it can ensure that the costs are comfortably met by maintaining an adequate revenue stream through dynamically optimized pricing and service offerings. It results in optimum utilization of the available resources, such as perishable inventory of hotel rooms, to generate the maximum amount of revenue from the business. Effectively, it allows the management to make an informed and data-driven decision.

Benefits

It provides insight into the customers' specific needs and wants, which can be incorporated into the product/service offerings.

It helps build a competitive pricing strategy that can draw more customers and offer an edge over the competitors.

Used to analyze the market to identify new and potential customer segments;

Disadvantages

- It makes the already complicated job of the manager even more complicated.
- In some cases, the revenue managers are worried about being replaced by the technology-driven revenue management system.

Key to Successful Revenue Management

- **Inculcate the Culture of Revenue Management:** It is essential to incorporate a culture wherein all the employees are well aware of its purpose and benefits.
- **Keep Pace with the Changing Customer Behavior:** Although historical information is vital for revenue management, it is equally important to keep track of changes in customer behavior and habits to build a robust strategy.

Focus on Value Proposition: Sometimes, it is better to focus on creating valuable product/service offerings than lowering the prices because people are usually willing to pay more if offered a better overall experience.

What is customer analytics?

Customer analytics, also called customer data analytics, is the systematic examination of a company's customer information and behaviour to identify, attract and retain the most profitable customers.

Why customer analytics matters?

Customers in the digital era have information at their fingertips about where to find goods and services, what to buy and how much to expect to pay. They can find the perfect products for their needs, and therefore, organizations must do everything they can to serve the right products and marketing campaigns to their audience. To do this, organizations can use customer analytics tools to understand their customers.

The goal of customer analytics is to create a single, accurate view of an organization's customer base, which can inform decisions about how to best acquire and retain future customers. It can also identify high-value customers and suggest proactive ways to interact with them.

Organizations that deeply understand their customers' buying habits and lifestyle preferences can more easily predict those people's behaviour and, therefore, can optimize the customer journey. Accurate analysis requires large amounts of accurate data. Without this, analysis insights may be wildly wrong and unhelpful.

How customer analytics works

Customer analytics is often managed by an interdisciplinary group of leaders from different departments, including marketing, sales, customer service, IT and business analysts. To obtain meaningful insights, the group must agree on which business metrics can comprehensively view the customer experience.

Customer analytics starts with raw data and ends with intelligent business decisions. Before the data can inform decisions, it must pass through three stages: collection, organization and analysis.

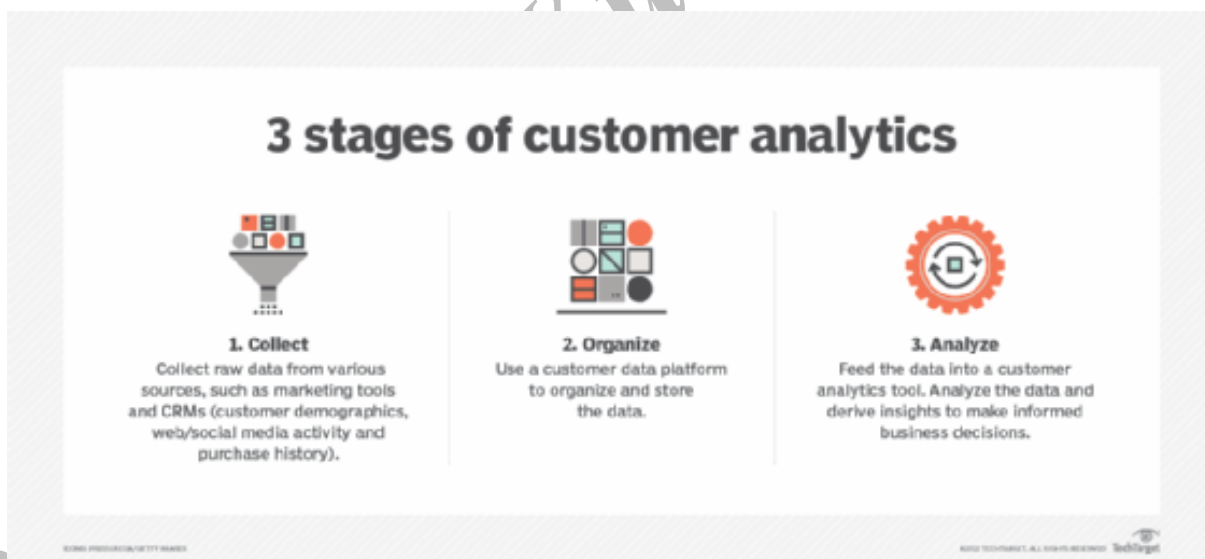
Collection. First, organizations must take in raw customer data from various sources, such as marketing tools, CRM systems or third-party sources. Such data may include the following:

- Demographics.
- Purchase history.
- Web and social media activity.
- Contact center interactions.
- Advertisement engagements.
- Survey responses.

Organization. Next, organizations must format the customer data to work in a customer analytics tool because unorganized data may produce an inaccurate customer profile. Multiple instances of CRMs, disparate enterprise resource planning systems or poor customer data integration can lead to inaccurate results. A customer data platform (CDP) can help organizations store and organize their data in a central location.

Analysis. A customer analytics tool helps organizations make sense of their collected data and can display trends in the form of charts and graphs. For example, the tool can combine demographics, purchase history and social media data. With these data points, the tool can produce a chart that reveals the organization's most valuable customer segment is middle-income women from New England who follow that organization on Instagram.

Organizations can derive insights from the tool's results and use them to make more informed business decisions. In the case of the preceding example, the organization may elect to increase its Instagram marketing budget or send personalized offers to women in New England.



The three stages of customer analytics.

Customer analytics best practices

Organizations can use the following best practices and customer experience metrics to create successful customer interactions.

- Target customers across all channels and analyze how to distribute a product or service.

- Assess and understand customers in relation to the brand and whether a customer is satisfied. This can be achieved through a combination of quantitative and qualitative surveys.
- Engage with customers at the right moment through the right channel.
- Predict churn rate and take actions to extend a customer's lifetime value.
- Spot trends in big data and analyze online behavior to increase sales.
- Optimize the customer journey through personalized selling and market segmentation by assessing which customers might buy one type of product versus another.

Customer analytics tools

Customer analytics tools are specialized apps used to improve the customer experience, understand customer behavior and help tailor marketing campaigns to specific customer segments.

These customer data analysis tools can be part of a CRM suite or sold as standalone platforms that do everything from collecting customer data from different systems in different locations (data integration) to data analysis and visualization. These tools also connect to popular sales and marketing applications, web content management systems, email, social platforms and customer loyalty programs.

Organizations have many customer analytics tools to choose from. Some tools from major vendors include the following:

- Adobe Analytics.
- Amplitude.
- Heap.
- Google Analytics 360.
- Mixpanel.

Many highly customizable analytics tools, such as Adobe Analytics, require experienced professionals to operate them, whereas simpler tools such as Heap may be better suited for

the average user. Adobe Analytics, Amplitude and Google Analytics 360 typically serve large enterprises, while Heap and Mixpanel tend to benefit small to mid-sized organizations.

5 top customer analytics tools

	STANDOUT FEATURES	TYPICAL USER SIZE	PREMIUM MODEL
Adobe Analytics	<ul style="list-style-type: none"> Highly customizable Premium customer journey mapping Integrates with Adobe marketing stack 	Enterprise	No
Amplitude	<ul style="list-style-type: none"> User-friendly Engaging visuals and charts User engagement tracking 	Enterprise	Yes
Google Analytics 360	<ul style="list-style-type: none"> Search engine keyword tracking Closed-loop Salesforce integration Integrates with Google marketing stack 	Enterprise	Yes
Heap	<ul style="list-style-type: none"> User-friendly Retroactive reports User engagement tracking 	Small to medium	Yes
Mixpanel	<ul style="list-style-type: none"> Cross-app tracking In-app messaging User engagement tracking 	Small to medium	Yes

Top customer analytics tools.

Cookies and the future of customer analytics

When people browse the internet, the websites they visit can send a text file known as a cookie to their browser containing identifying information. Cookies allow websites to collect information about a user's session for personalization purposes. However, not all cookies are the same.

First-party cookies are restricted to the website that sent them and serve to improve the site's UX. For instance, they let a website remember what items customers put in their shopping carts. Third-party cookies, on the other hand, come from websites other than the one a person visits and are more controversial. Advertisers can use them to track a user's session across multiple sites and target them with personalized advertisements based on their activity.

Customer analytics uses data to generate marketing insights, and third-party cookies have been a major source of that data since the 1990s. Apple Safari and Mozilla Firefox browsers have blocked third-party cookies since 2013 due to privacy concerns, while Google has held

on to them. However, Google plans to eliminate these cookies from its Chrome browser in 2024.

Third-party cookie elimination leaves marketers with less customer data to feed into analytics tools and has organizations looking for other ways to create effective marketing campaigns. In March 2021, Google began testing the Federated Learning of Cohorts (FLoC) as an alternative to third-party cookies. However, they ended the project by July of that year after criticism over privacy concerns. In 2022, Google announced Topics as a proposed alternative to FLoC and began testing it in a developer trial.

Organizations shouldn't wait for Google to reinvent the third-party cookie and, instead, take the following proactive approaches:

- **Make the most of first-party data.** Unlike third-party cookies, first-party cookies aren't going away. Organizations should invest in CDPs and analytics tools to transform the data they collect from their sources into marketing insights.
- **Collect zero-party data.** Organizations can use creative methods, such as online quizzes, social media polls and loyalty cards to collect voluntary information -- zero-party data -- from their customers.
- **Work with publishers.** Many online publishers use an opt-in membership model to collect large amounts of first-party data that can provide clients with prospects and marketing insights.
- **Use contextual marketing.** A content source that shows ads relevant to its content is an example of contextual marketing, a targeted marketing form that doesn't require third-party cookies.

What is Customer Lifetime Value (CLV)?

Customer Lifetime Value (CLV) is the total predictable revenue your business can make from a customer during their lifetime as a paying customer.

For instance, if a customer subscribes to one of your products under a one-year plan, at that time, the lifetime of that customer is one year long. Their lifetime value will be the amount you expect to make in that year.

Hence, the longer the customers stay and the more often the customer buys from you, the greater will be their CLV. If you can determine the profile of the customers that produce the highest CLV, you can use those profiles to acquire more customers that closely resemble those existing high-value customers.

Why is calculating Customer Lifetime Value important for your subscription business? Let's look at some of the significant benefits of monitoring CLV for a subscription business.

Identify high-value customers

Businesses don't want to spend their money and resources on acquiring customers that will not be profitable. They want to know how much they should invest in marketing activities that will attract the best customers. But what does 'Best Customer' mean to them? There are different answers to this: Customers who are the most loyal, customers who are the most profitable, customers who are easier to attract and retain.

Well, how about all of the above? These are called high-value customers or customers having high Customer Lifetime Value (CLV). By calculating the CLV of each customer and ranking them by the results, you can identify the high-value customers. The higher the CLV, the more valuable the customer. Hence, measuring CLV helps you to knowledgeably build out your product, tailor your marketing and sales activities to maximize the likelihood of acquiring and retaining such high-value customers.

Determine how much to invest in the acquisition

Nothing bogs down a business faster than spending more money to acquire customers than you receive once they've signed with you. That's why understanding how your CLV relates to the Customer Acquisition Cost is important. While CAC answers how much it costs to acquire a new customer, the CLV reflects the other half of the equation – how much is a customer worth. The balanced ratio of these two metrics gives answers the ultimate question – “what is the true value of the customer to my business?”. Together, the metrics CAC and CLV represent a prototypical Return On Investment (ROI) a business can gain from an acquired customer and helps to check whether the investment levels are sustainable for long-term business viability and value creation.

Let's understand the relation between CLV and CAC through the example of a subscription box business. Suppose they sell their products under three different plans: Small box: \$8/box, Medium box: \$16/box, and Big box: \$21/box.

An average customer buys fifteen boxes every year for 8 years, so the revenue from a given customer equals \$1800 $[(8+16+21)/3 * 15 \text{ boxes} * 8 \text{ years} = \$1800]$.

To earn \$1800 from customers, the business first needs to target and acquire customers. They spend around \$7500 a month to acquire 100 customers. Their CAC is \$75 ($\$7500/100$), meaning they spent \$75 to acquire each customer. Additional costs that the business incurs per customer per year are \$30.

The CLV of a customer to the business is therefore \$1800 (calculated above) – \$80 (Total CAC: $8 \text{ years} * \$10/\text{year}$) – \$30 (additional costs) = \$1690.

This means that the average customer is worth \$1690 in profit over the eight-year relationship with the business. Since the CAC of \$75 is lesser than the CLV of \$1690, we can infer that the business is spending its marketing budget wisely and will gain more profits from each customer than it invested in acquiring them.

Build brand loyalty

Brand loyalty is one of the important and most challenging strong points for a business to achieve. The CLV provides a better dimension to customer relationships by making businesses aware of a customer's worth, especially those considered loyal having high CLV.

High CLV customers are loyal customers, and they offer your company many benefits. They stick with your business longer and offer valuable feedback as they grow with you. Those customers become the best brand advocates giving you good word-of-mouth referrals that hugely help in building your brand reputation.

Hence, focusing on improving your CLV through different loyalty initiatives plays a significant role in driving customer engagement and building strong brand loyalty.

How to calculate Customer Lifetime Value (CLV)?

Customer Lifetime Value is calculated by multiplying your customers' average purchase value, average purchase frequency, and average customer lifespan.

Customer Lifetime Value formula:

$$\text{CLV} = \text{Average Purchase Value} * \text{Average Purchase Frequency} * \text{Average Customer Lifespan}$$

Step 1:

Average Purchase Value (APV) can be calculated by totaling the revenue earned in a specific period and dividing it by the total number of sales generated during that same period.

$$\text{Average Purchase Value} = \frac{\text{Total revenue}}{\text{Total number of purchases}}$$

For instance, if your business generated \$20,000 revenue in a month from 200 sales, the APV for that period is $\$20,000 / 200 = \100 .

Step 2:

Average Purchase Frequency (APF) is calculated by dividing the number of purchases made by the number of unique customers.

$$\text{Average Purchase Frequency} = \frac{\text{Number of purchases}}{\text{Number of unique customers}}$$

If a customer made multiple purchases over a specific period, they are counted only once in the calculation.

If your business generated \$20,000 in a year from 40 customers who collectively made 200 purchases, then the APF is $200 \text{ purchases} / 40 \text{ customers} = 5 \text{ times}$.

Step 3:

Average Customer Lifespan (ACL) is calculated by adding all of your customer lifespans and dividing by the total number of customers.

$$\text{Average Customer Lifespan} = \frac{\text{Sum of customer lifespans}}{\text{Number of customers}}$$

If your business is new and lacks the sample size of customers required for the calculation, ACL can also be derived from the churn rate.

$$\text{Lifespan} = 1 / \text{Churn rate}$$

Churn rate = (Customers at the beginning of the period – customers at the end of the period) / customers at the beginning of the period

For instance, if your business has 50 customers at the beginning of the month but only has 45 at the end of the month, then the churn rate is $(50 - 45) / 50 = 0.1$.

Then the Average Customer Lifespan (ACL) will be,

$$1 / \text{Churn rate} = 1 / 0.1 = 10 \text{ months.}$$

Step 4:

Now that we have all the components needed for CLV, we can calculate it by simply multiplying them all together.

With an Average Purchase Value of \$100, an Average Purchase Frequency of 5, and an Average Customer Lifespan of 36 months, the Customer Lifetime Value is:

$$\text{Average CLV} = \$100 * 5 * 36 = \$18,000$$

Using gross margin to get a more accurate CLV

Calculating CLV tells you how much revenue you're getting from each customer, but not how much profit. To get a more accurate idea of the profitability of each customer, you'll need to factor in your gross margin or the percentage of your revenue that generally goes toward buying more goods.

$$\text{Customer Lifetime Value} = \text{Average Purchase Value} \times \text{Average Purchase Frequency} \times \text{Average Customer Lifespan} \times \text{Gross margin}$$

Your gross margin is the percentage of your total revenue that remains after subtracting the Cost Of Goods Sold (COGS).

$$\text{Gross margin} = \left[\frac{(\text{Total revenue} - \text{COGS})}{\text{Total revenue}} \right] * 100$$

For instance, if your total revenue generated per month is \$20,000 and your COGS is \$8,000, you would first subtract the COGS from the revenue and get $\$20,000 - \$8,000 = \$12,000$.

Then, divide the resulting value by the total revenue ($12,000 / 20,000 = 0.6$) to arrive at a gross margin of 0.6.

To represent gross margin as a percentage: $0.6 * 100 = 60\%$

To arrive at your more accurate CLV, multiply the customer value, average customer lifespan, and gross margin:

$$CLV = 500 * 36 * 0.6 = \$10,800$$

This value is significantly lower than the \$18,000 we got from the earlier CLV calculation, showing that quite a lot of the revenue you get from each customer is simply recouping the cost of the goods they're purchasing. If you want to understand the value of your customers in terms of the money you can actually put back into the rest of your business operations, it's worthwhile to put in the effort to determine the gross margin and include it in the CLV calculation.

Approaches to CLV calculation

Although we saw one simple CLV formula above, there isn't just one way to calculate CLV.

There are several approaches, including historical, predictive, and traditional, and the best method to use depends on your business type and resources.

Historical approach

Historical CLV is a straightforward approach to calculating a customer's lifetime value based on the gross profit your business has made in the past. The calculation is simple because you only need data on previous purchases. You can compute historical CLV using either Average Revenue Per User (ARPU) or cohort analysis.

$$ARPU = \frac{\text{Total revenue in a specific period}}{\text{Number of customers during the same period}}$$

Suppose that 20 of your customers brought in \$1,300 in revenue for your business over three months. Your ARPU for three months is $\$1,300 / 20 = \65

Let's calculate how much these customers will bring you in one year.

ARPU for 12 months = ARPU for 3 months * 4

$\$65 * 4 = \260 per year per customer

Cohort analysis takes the ARPU method further by grouping together customers who made their first purchase during the same month and have similar characteristics. If you have a large enough data set, you can use cohort analysis to calculate the average revenue for specific cohorts whose characteristics are relevant to the forecast you're trying to create, instead of for your average customer.

The biggest drawback of historical CLV is that it lumps customers together who may not have the same purchasing behavior at all. This can be a problem if you're changing your products or marketing behavior, for example. Changes you've made recently may already be bringing in new customers whose preferences and purchasing decisions won't be accurately predicted by historical CLV. Cohort analysis can help to some extent, by allowing you to select cohorts of customers that are more likely to resemble your future customers. But as long as you're still using data derived from older customer cohorts, you may still find that it's not accurately predicting your future CLV.

Predictive approach

Predictive CLV is intended to measure the total value a customer will give a business eventually over their entire lifetime. The predictive approach is based on both historical

transactions and current customers' behavioral trends, such as purchase frequency. Unlike historical CLV, which can provide only insights into what has happened before, predictive CLV helps you understand the present worth of a customer and forecast how their value will change in the future. This may help you launch targeted campaigns and prioritize your acquisition and engagement activities so that they attract and retain customers with high lifetime value.

$$\text{Predictive CLV formula} = \frac{(T \times \text{AOV} \times \text{AGM} \times \text{ALT})}{\text{Number of customers at the end of the particular period}}$$

T: Average number of transactions per month

AOV: Average Order Value

AGM: Average Gross Margin

ALT: Average customer lifetime (in months)

Now let's create some hypothetical values to plug into this formula.

1. T (Average number of transactions):

Period: 3 months

Total transactions: 120

$$T = 120/3 = 40$$

2. AOV (Average Order Value)

Total revenue over a specific month (August): \$10,000

Number of orders: 20

$$\text{AOV} = \$10,000 / 20 = \$500$$

3. AGM (Average Gross Margin)

– Calculate gross margin percentage per month

$$\text{Gross Margin} = [(\text{Total Revenue} - \text{Cost of Goods Sold}) / \text{Total Revenue}] * 100$$

Example:


Total revenue (August): \$10,000

Cost of Goods sold: \$8,000

$$\text{Gross Margin (\%)} = [(\$10,000 - \$8,000) / \$10,000] * 100 = 33\%$$

– Determine average gross margin for a three-month period.

Month	Total Revenue	Cost of Goods Sold	Gross Margin
July	\$12,500	\$9,000	0.28
August	\$10,000	\$8,000	0.33
September	\$12,000	\$8,900	0.26
Total Gross Margin			0.87

 ZOH Books

$$\text{Total Gross Margin} = 0.87$$

$$\text{Average Gross Margin} = 0.29$$

4. ALT (Average lifespan of a customer)

ALT = 1/ Churn rate

To measure churn rate:

$$\text{Churn rate} = \frac{(\text{Customers at the beginning of the month} - \text{Customers at the end of the month})}{\text{Customers at the beginning of the month}}$$

Example:

You had 200 customers at the beginning of August and 150 customers at the end of September. The churn rate will be:

$$200 - 150) / 200 = 50 / 200 = 0.25, \text{ or } 25\%$$

$$\text{ALT (Average customer lifespan)} = 1 / 25\% = 1 / 0.25 = 4 \text{ months}$$

Now, we have all the values needed for our predictive CLV calculation:

$$\text{Average number of transactions (T)} = 40$$

$$\text{Average Order Value (AOV)} = \$500$$

$$\text{Average Gross Margin (AGM)} = 0.29$$

$$\text{Average customer lifespan (ALT)} = 4 \text{ months}$$

Predicted CLV = (T * AOV * AGM * ALT) / Number of customers at the end of the particular period

$$\text{Predicted CLV} = (40 * \$500 * 0.29 * 4) / 150 \text{ customers at the end of September}$$

$$= \$23,200 / 150$$

$$= \$154.66$$

Traditional approach

Business growth is anything but linear. So, what happens when your sales per customer don't stay the same year after year, and you need to consider the changes that happen across the customer's lifetime? In this situation, you need a more in-depth CLV formula that takes margins, inflation, and retention rate into account and gives a more nuanced picture of how CLV changes over the years.

$$\text{Traditional CLV formula} = \text{GML} \times \left[\frac{R}{(1+D-R)} \right]$$

GML is the Gross Margin contribution per customer, which is the profit you expect to make over the average customer lifespan. It consists of revenue minus the Cost of Goods Sold.

R is the retention rate: the percentage of customers who stick with your business over a defined period.

D is the discount rate, which is included to account for inflation. Generally, a discount rate of 10% is used for SaaS businesses.

Example:

- **Gross Margin Contribution per customer (GML)**

$$\text{Gross Margin Contribution per customer (GML)} = \text{Gross Margin} \times \text{Average total revenue per customer}$$

Gross Margin = 0.29

Average total revenue = \$1,000

GML = 0.29 * 1,000 = \$290

- **Retention rate**

$$\text{Retention rate} = \left[\frac{(\text{Customers at the end of the month} - \text{Customers acquired during the month})}{\text{Customers at the beginning of the month}} \right] \times 100$$

Suppose that for September you had:

Customers at the end of the month = 300

Customers acquired during the month = 50

Customers at the beginning of the month = 270

$R = [(300 - 50) / 270] * 100 = (250 / 270) * 100 = 0.9 * 100 = 90\%$

- **Discount rate:** let's take the standard discount rate of 10%.

Now just plug the values into the CLV equation.

$$\text{CLV} = \text{GML} * [R / (1 + D - R)]$$

$$\text{CLV} = \$290 * [0.9 / (1 + 0.1 - 0.9)]$$

$$= \$290 * (0.9 / 0.2)$$

$$= \$290 * 4.5$$

$$= \$1,305.$$

What Is a Monte Carlo Simulation?

A Monte Carlo simulation is used to model the probability of different outcomes in a process that cannot easily be predicted due to the intervention of random variables. It is a technique used to understand the impact of risk and uncertainty.

A Monte Carlo simulation is used to tackle a range of problems in many fields including investing, business, physics, and engineering. It is also referred to as a multiple probability simulation.

How Does the Monte Carlo Simulation Assess Risk?

When faced with significant uncertainty in making a forecast or estimate, some methods replace the uncertain variable with a single average number. The Monte Carlo Simulation instead uses multiple values and then averages the results.

Monte Carlo simulations have a vast array of applications in fields that are plagued by random variables, notably business and investing. They are used to estimate the probability of cost overruns in large projects and the likelihood that an asset price will move in a certain way.

What Is the History of the Monte Carlo Simulation?

The Monte Carlo simulation was named after the gambling destination in Monaco because chance and random outcomes are central to this modeling technique, as they are to games like roulette, dice, and slot machines.

The technique was initially developed by Stanislaw Ulam, a mathematician who worked on the Manhattan Project, the secret effort to create the first atomic weapon. He shared his idea with John Von Neumann, a colleague at the Manhattan Project, and the two collaborated to refine the Monte Carlo simulation.

How Does the Monte Carlo Simulation Method Work?

The Monte Carlo method acknowledges an issue for any simulation technique: the probability of varying outcomes cannot be firmly pinpointed because of random variable interference. Therefore, a Monte Carlo simulation focuses on constantly repeating random samples.

A Monte Carlo simulation takes the variable that has uncertainty and assigns it a random value. The model is then run and a result is provided. This process is repeated again and again while assigning many different values to the variable in question. Once the simulation is complete, the results are averaged to arrive at an estimate.

The 4 Steps in a Monte Carlo Simulation

To perform a Monte Carlo simulation, there are four main steps. Microsoft Excel or a similar program can be used to create a Monte Carlo simulation that estimates the probable price movements of stocks or other assets.

There are two components to an asset's price movement: drift, which is its constant directional movement, and a random input, which represents market volatility.

By analyzing historical price data, you can determine the drift, standard deviation, variance, and average price movement of a security. These are the building blocks of a Monte Carlo simulation.

To create a Monte Carlo simulation, consider the following four steps:

Step 1: To project one possible price trajectory, use the historical price data of the asset to generate a series of periodic daily returns using the natural logarithm (note that this equation differs from the usual percentage change formula):

$$\text{Periodic Daily Return} = \ln(\text{Day's Price} / \text{Previous Day's Price})$$

$$\text{Periodic Daily Return} = \ln(\text{Previous Day's Price} / \text{Day's Price})$$

Step 2: Next use the AVERAGE, STDEV.P, and VAR.P functions on the entire resulting series to obtain the average daily return, standard deviation, and variance inputs, respectively. The drift is equal to:

$$\text{Drift} = \text{Average Daily Return} - \frac{\text{Variance}}{2}$$

where: Average Daily Return = Produced from Excel's AVERAGE function from periodic daily returns series
 Variance = Produced from Excel's VAR.P function from periodic daily returns series
 Drift = Average Daily Return - 2Variance
 where: Average Daily Return = Produced from Excel's AVERAGE function from periodic daily returns series
 Variance = Produced from Excel's VAR.P function from periodic daily returns series

Alternatively, drift can be set to 0; this choice reflects a certain theoretical orientation, but the difference will not be huge, at least for shorter time frames.

Step 3: Next, obtain a random input:

$$\text{Random Value} = \sigma \times \text{NORMSINV}(\text{RAND}())$$

where: σ = Standard deviation, produced from Excel's STDEV.P function from periodic daily returns series
 NORMSINV and RAND = Excel functions

$$\text{Random Value} = \sigma \times \text{NORMSINV}(\text{RAND}())$$

where: σ = Standard deviation, produced from Excel's STDEV.P function from periodic daily returns series
 NORMSINV and RAND = Excel functions

The equation for the following day's price is:

$$\text{Next Day's Price} = \text{Today's Price} \times \sigma (\text{Drift} + \text{Random Value})$$

$$\text{Next Day's Price} = \text{Today's Price} \times e^{(\text{Drift} + \text{Random Value})}$$

Step 4: To take e to a given power x in Excel, use the EXP function: EXP(x). Repeat this calculation the desired number of times. (Each repetition represents one day.) The result is a simulation of the asset's future price movement.

By generating an arbitrary number of simulations, you can assess the probability that a security's price will follow a given trajectory.

Monte Carlo Simulation Results Explained

The frequencies of different outcomes generated by this simulation will form a normal distribution, that is, a bell curve. The most likely return is in the middle of the curve, meaning there is an equal chance that the actual return will be higher or lower.

The probability that the actual return will be within one standard deviation of the most probable ("expected") rate is 68%. The probability that it will be within two standard deviations is 95%, and that it will be within three standard deviations 99.7%.

Still, there is no guarantee that the most expected outcome will occur, or that actual movements will not exceed the wildest projections.

Crucially, a Monte Carlo simulation ignores everything that is not built into the price movement such as macro trends, a company's leadership, market hype, and cyclical factors).

In other words, it assumes a perfectly efficient market.

Advantages and Disadvantages of a Monte Carlo Simulation

The Monte Carlo method is used to help an investor estimate the likelihood of a gain or a loss on a certain investment. Other methods have the same aim.

The Monte Carlo simulation was created to overcome a perceived disadvantage of other methods of estimating a probable outcome.

No simulation can pinpoint an inevitable outcome. The Monte Carlo method aims at a sounder estimate of the probability that an outcome will differ from a projection.

The difference is that the Monte Carlo method tests a number of random variables and then averages them, rather than starting out with an average.

Like any financial simulation, the Monte Carlo method uses historical price data as the basis for a projection of future price data. It then disrupts the pattern by introducing random variables, represented by numbers. Finally, it averages those numbers to arrive at an estimate of the risk that the pattern will be disrupted in real life.

How Is the Monte Carlo Simulation Used in Finance Applications?

The Monte Carlo simulation is used to estimate the probability of a certain income. As such, it is widely used by investors and financial analysts to evaluate the probable success of investments they're considering. Some common uses include:

- **Pricing stock options.** The potential price movements of the underlying asset are tracked given every possible variable. The results are averaged and then discounted to the asset's current price. This is intended to indicate the probable payoff of the options.
- **Portfolio valuation.** A number of alternative portfolios can be tested using the Monte Carlo simulation in order to arrive at a measure of their comparative risk.
- **Fixed income investments.** The short rate is the random variable here. The simulation is used to calculate the probable impact of movements in the short rate on fixed rate investments.

What Professions Use the Monte Carlo Simulation?

It may be best known for its financial applications, but the Monte Carlo simulation is used in virtually every profession that must measure risks and prepare to meet them.

For example, a telecom may build its network to sustain all of its users all of the time. In order to do that, it must consider all of the possible variations in demand for the service. It must determine whether the system will stand the strain of peak hours and peak seasons.

A Monte Carlo simulation may help the telecom company decide whether its service is likely to stand the strain of Super Bowl Sunday as well as an average Sunday in August.

What Factors Are Evaluated in a Monte Carlo Simulation?

A Monte Carlo simulation in investing is based on historical price data on the asset or assets being evaluated.

The building blocks of the simulation, derived from the historical data, are drift, standard deviation, variance, and average price movement.

Retailing is the selling of goods and services to consumer end users. Retailing is seen as a contrast to wholesaling, which typically involves selling in mass quantities at lower prices.

Retailers frequently buy in bulk from wholesalers, then repackage merchandise for individual sale. A retailer's profit is based in part on the difference between the wholesale and retail prices of merchandise bought and sold.

Competition in retail

Retailing is extremely competitive, and the rate of failure among retail establishments is relatively high. There are multiple competitive factors:

- **Price** is a primary competitive factor that both digital and physical stores have in common.
- **Convenience of location** affects physical retail establishments.
- **Efficient delivery systems** affect mostly digital-only (but also physical) stores.
- **Selection and display of merchandise** reflects the variety and quality of products being sold.
- **Promotions and special offers** can create a sense of urgency, especially among bargain hunters.
- **Attractiveness** of the retail establishment can affect customers' shopping experience, brand perception, and overall satisfaction.
- **Branding and reputation** are also critical factors that can increase familiarity, product "stickiness," and brand loyalty.

Competition has prompted many retail stores to diversify their product offerings. For example, pharmacies often sell food, clothes, office supplies, and tobacco products, among other items traditionally not associated with a pharmacy.

Some stores, like Costco, specialize in selling items in large quantities. Other establishments, like Walmart, operate superstores offering an enormous variety of products at low prices.

Retail goes online

The rise of the Internet gave birth to e-commerce in the 1990s, which brought about a radical shift in the retail space from physical to online stores. People began buying products via personal computers, mobile phones, and other online devices.

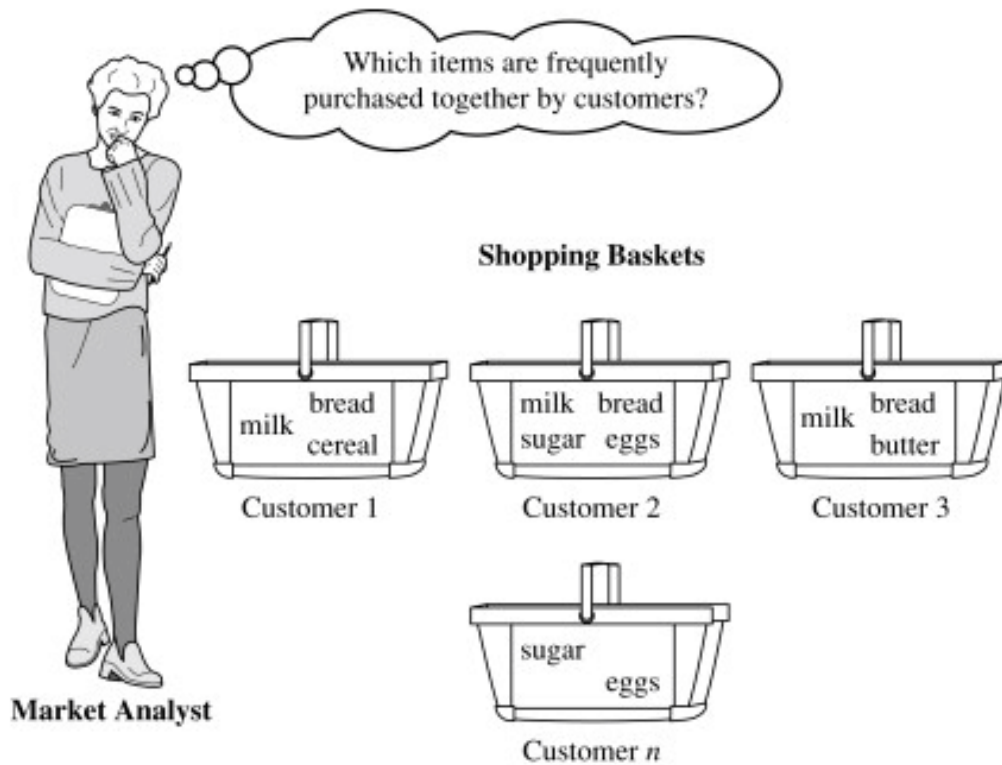
To adapt to these changing conditions, many established brick-and-mortar businesses began selling products online, while online-only stores and shopping platforms like Amazon.com and online auction site eBay saw spectacular growth. By the 2010s, this shift led to lower sales in many physical stores, but most retail purchases still happened in person.

What Is Market Basket Analysis?

Market basket analysis is a strategic data mining technique used by retailers to enhance sales by gaining a deeper understanding of customer purchasing patterns. This method involves examining substantial datasets, such as historical purchase records, to unveil inherent product groupings and identify items that customers tend to buy together.

By recognizing these patterns of co-occurrence, retailers can make informed decisions to optimize inventory management, devise effective marketing strategies, employ cross-selling tactics, and even refine store layout for improved customer engagement.

For example, if customers are buying milk, how probably are they to also buy bread (and which kind of bread) on the same trip to the supermarket? This information may lead to an increase in sales by helping retailers to do selective marketing based on predictions, cross-selling, and planning their ledge space for optimal product placement.



Source: Sciencedirect

Now, just think of the universe as the set of items available at the store, then each item has a Boolean variable that represents the presence or absence of that item. Now, we can represent each basket with a Boolean vector of values assigned to these variables. We can then analyze the Boolean vectors to identify purchase patterns that reflect items frequently associated or bought together, representing such patterns in the form of association rules.

How Does Market Basket Analysis Work?

1. Collect data on customer transactions, such as the items purchased in each transaction, the time and date of the transaction, and any other relevant information.
2. Clean and preprocess the data, removing any irrelevant information, handling missing values, and converting the data into a suitable format for analysis.

3. Use association rules mining algorithms such as Apriori or FP-Growth to identify frequent item sets, sets of items often appearing together in a transaction.
4. Calculate the support and confidence for each frequent itemset, expressing the likelihood of one item being purchased given the purchase of another item.
5. Generate association rules based on the frequent itemsets and their corresponding support and confidence values. Association rules indicate the likelihood of purchasing one item given the purchase of another item.
6. Interpret the results of the market basket analysis, identifying frequent purchases, assessing the strength of the association between items, and uncovering other relevant insights into customer behavior and preferences
7. Use the insights from the market basket analysis to inform business decisions such as product recommendations, store layout optimization, and targeted marketing campaigns.

Types of Market Basket Analysis

1. **Predictive Market Basket Analysis** employs supervised learning to forecast future customer behavior. By recognizing cross-selling opportunities through purchase patterns, it enables applications like tailored product recommendations, personalized promotions, and effective demand forecasting. Additionally, it proves valuable in fraud detection.
2. **Differential Market Basket Analysis** compares purchase histories across diverse segments, unveiling trends and pinpointing buying habits unique to specific customer groups. Its applications extend to competitor analysis,

identification of seasonal trends, customer segmentation, and insights into regional market dynamics.

Applications of Market Basket Analysis

Industry	Applications of Market Basket Analysis
Retail	Identify frequently purchased product combinations and create promotions or cross-selling strategies
E-commerce	Suggest complementary products to customers and improve the customer experience
Hospitality	Identify which menu items are often ordered together and create meal packages or menu recommendations
Healthcare	Understand which medications are often prescribed together and identify patterns in patient behavior or treatment outcomes
Banking/Finance	Identify which products or services are frequently used together by customers and create targeted marketing campaigns or bundle deals
Telecommunications	Understand which products or services are often purchased together and create bundled service packages that increase revenue and improve the customer experience

What Is Association Rule for Market Basket Analysis?

Let $I = \{I_1, I_2, \dots, I_m\}$ be an itemset. These itemsets are called antecedents. Let D , the data, be a set of database transactions where each transaction T is a nonempty itemset such that $T \subseteq I$. Each transaction is associated with an identifier called a TID(or Tid).

Let A be a set of items(itemset). T is the Transaction that is said to contain A if $A \subseteq T$.

An **Association Rule** is an implication of form $A \Rightarrow B$, where $A \subset I$, $B \subset I$, and $A \cap B = \emptyset$.

The rule $A \Rightarrow B$ holds in the data set(transactions) D with supports, where 's' is the percentage of transactions in D that contain $A \cup B$ (i.e., the union of set A and set B , or both A and B). This is taken as the probability, $P(A \cup B)$. Rule $A \Rightarrow B$ has confidence c in the transaction set D , where c is the percentage of transactions in D containing A that also contains B . This is taken to be the conditional probability, like $P(B|A)$. That is,

- $support(A \Rightarrow B) = P(A \cup B)$
- $confidence(A \Rightarrow B) = P(B|A)$

Rules that meet both a minimum support threshold (called min sup) and a minimum confidence threshold (called min conf) are termed as ‘Strong’

- $Confidence(A \Rightarrow B) = P(B|A) =$
- $support(A \cup B) / support(A) =$
- $support\ count(A \cup B) / support\ count(A)$

Generally, Association Rule Mining can be viewed in a two-step process:

1. Find all Frequent itemsets: *By definition, each of these itemsets will occur at least as frequently as a pre-established minimum support count, min sup.*
2. Generate Association Rules from the Frequent itemsets: *By definition, these rules must satisfy minimum support and minimum confidence.*

Association Rule Mining

Association Rule Mining is primarily used when you want to identify an association between different items in a set and then find frequent patterns in a transactional database or relational database.

The best example of the association is as you can see in the following image.

Frequently bought together



+



Total price: ₹1,359.00

Add both to Cart

i These items are dispatched from and sold by different sellers. [Show details](#)

✓ This item: Acco & Deco Engineered Wood Open Bookcase ,Wood Finish ,Set Of 1,Brown ₹929.00

✓ DECORVAIZ MDF Decorative Hanging Floating Display Shelves,Glossy Finish,Set Of 3,Black ₹430.00

Algorithms Used in Market Basket Analysis

There are multiple data mining techniques and algorithms used in Market Basket Analysis. In predicting the probability of items that customers are buying together, one of the important objectives is to achieve accuracy.

- **Apriori Algorithm**
- **AIS**
- **SETM Algorithm**
- **FP Growth**

1. Apriori Algorithm

The Apriori Algorithm widely uses and is well-known for Association Rule mining, making it a popular choice in market basket analysis. AI and SETM algorithms consider it more accurate. It helps to find frequent itemsets in transactions and identifies association rules between these items. The limitation of the Apriori Algorithm is *frequent itemset generation*. It needs to scan the database many times, leading to increased time and reduced performance as a computationally costly step because of a large dataset. It uses the concepts of Confidence and Support.

2. AIS Algorithm

The AIS algorithm creates multiple passes on the entire database or transactional data. During every pass, it scans all transactions. As you can see, in the first pass, it counts the support of separate items and determines then which of them are frequent in the database. After each transaction scan, the algorithm enlarges huge itemsets from each pass to generate candidate itemsets. It determines the common itemsets between the itemsets of the previous pass and the items of the current transaction. This algorithm, developed to generate all large itemsets in a transactional database, was the first published algorithm of its kind.

. It focused on the enhancement of databases with the necessary performance to process decision support. This technique is bounded to only one item in the consequent.

- **Advantage:** The AIS algorithm was used to find whether there was an association between items or not.
- **Disadvantage:** The main disadvantage of the AIS algorithm is that it generates too many candidates set that turn out to be small. As well as the data structure is to be maintained.

3. SETM Algorithm

This Algorithm is quite similar to the AIS algorithm. The **SETM** algorithm creates collective passes over the database. As you can see, in the first pass, it counts the support of single items and then determines which of them are frequent in the database. Then, it also generates the candidate itemsets by enlarging large itemsets of the previous pass. In addition to this, the SETM algorithm recalls the TIDs(transaction ids) of the generating transactions with the candidate itemsets.

- **Advantage:** While generating candidate itemsets, the SETM algorithm arranges candidate itemsets together with the TID(transaction Id) in a sequential manner.
- **Disadvantage:** For every item set, there is an association with Tid; hence it requires more space to store a huge number of TIDs.

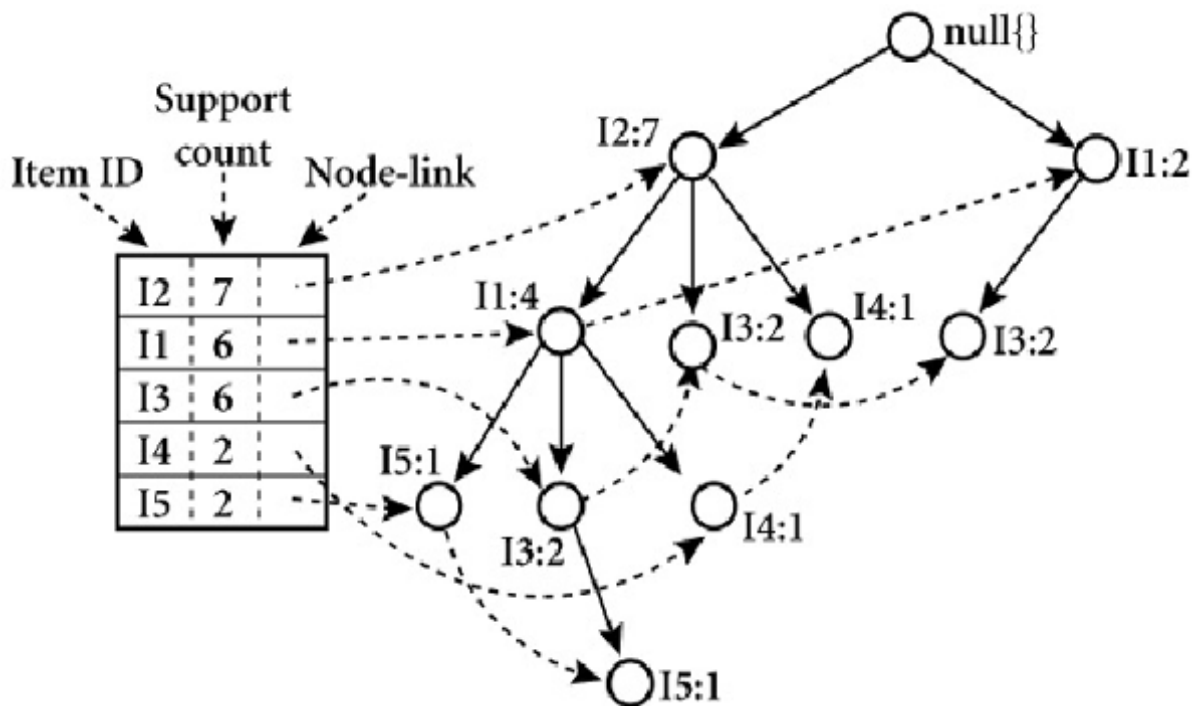
4. FP Growth

FP Growth is known as Frequent Pattern Growth Algorithm. FP growth algorithm is a concept of representing the data in the form of an FP tree or Frequent Pattern. Hence FP Growth is a method of *Mining Frequent Itemsets*. This algorithm is an advancement to the **Apriori Algorithm**. There is no need for candidate generation to generate a frequent pattern. This frequent pattern tree structure maintains the association between the itemsets.

A Frequent Pattern Tree is a tree structure that is made with the earlier itemsets of the data. The main purpose of the FP tree is to mine the most frequent patterns. Every node of the FP tree represents an item of that itemset. The root node represents the null value, whereas the lower nodes represent the itemsets of the data. While creating the tree, it maintains the association of these nodes with the lower nodes, namely, between itemsets.

For Example:

ProJ



Source: i.imgur

Advantages of Market Basket Analysis

There are many advantages to implementing Market Basket Analysis in marketing. Market Basket Analysis (MBA) applies to customer data from point of sale (PoS) systems.

It helps retailers in the following ways:

- Increases customer engagement
- Boosts sales and increases ROI
- Improves customer experience
- Optimizes marketing strategies and campaigns
- Helps in demographic data analysis
- Identifies customer behavior and pattern

Market Basket Analysis From the Customers' Perspective

Let us take an example of market basket analysis from Amazon, the world's largest eCommerce platform. From a customer's perspective, Market Basket Analysis is like *shopping at a supermarket*. Generally, it observes all items bought by customers together in a single purchase. Then it shows the most related products together that customers will tend to buy in one purchase.



What Is Sales Lift?

Sales lift, often referred to as incremental sales lift, is a way for marketers and retailers to calculate the effectiveness of their marketing efforts and promotions.

Sales lift is defined as the incremental increase in sales that occurs during a specific promotional time period versus the baseline sales that would have occurred during that same time period had the promotion never been launched.

Calculating Lift In Sales

The incremental sales lift formula is a relatively simple one but first we should define some sales data points.

Actual Sales – This is the dollar amount of total product sales during a specified promotional time period.

Baseline Sales – This is the estimated dollar amount of total sales during the same time period if the promotional campaign had not taken place. Baseline sales data can be determined in a variety of ways. The previous year’s sales data can be used to predict a baseline. Some retailers compile sales data for a set time period prior to a promotional launch and compare it to sales data for that same length of time post promotion to average out a baseline figure.

Incremental Sales Lift – The difference between actual sales and baseline sales equals sales lift. This can also be determined as a percentage of sales increase.

To calculate lift, we have a two-step formula:

$$\text{Actual Sales} - \text{Baseline Sales} = \text{Incremental Sales Lift}$$

Then, to determine the sales increase by percentage:

$$\text{Incremental Sales Lift} \div \text{Baseline Sales} \times 100 = \% \text{ Increase}$$

With this two-step process, brands and marketers are able to see the impact of their advertising, marketing and promotional programs. It’s spelled out in hard sales data that facilitates a clear and confident analysis of incremental lift.

Determining Lift Using Test Markets

Lift is calculated to see if a marketing effort or promotion actually generates a measurable lift in sales. We gave you the formula to determine lift, however, there’s another way to measure it without having to guestimate a baseline sales figure.

In this method, lift is calculated by using control and test markets. In other words, you run a promotion in one store or market and compare sales to those generated in a similar store or market that does not run the promotion. There are a few ways to set up test and control markets.

1. **Matched Markets:** A brand selects two markets or locations that enjoy similar demographics. One deploys the promotion. The other does not. Lift is determined by the difference in sales.

2. **Balance of The Chain:** In this case, a larger brand will select a set of markets that generally represent the brand's coverage area and audience demographics. This set of markets deploys the promotion, while stores in the rest of the country do not. Average sales in the set are compared to sales nationwide.
3. **Group to Group:** This method involves determining two similar "sets" of sales regions. One set gets the promotion, the other does not. Average sales are then compared to measure incremental lift.

Other Data That Impacts Lift

Determining baseline sales data or test markets are not the only considerations for a brand that's looking to measure its promotions. Other data, including seasonal trends, traffic, merchandising compliance, inventory data, customer behavior, customer engagement, and competitive intelligence should also be considered when performing a sales lift analysis. Performance in all of these areas, after all, impacts retail sales, which is why new advancements in data-driven retail technology are now driving decisions for many brands and retailers.

Benefits of RFM Analysis

RFM analysis enables marketers to increase revenue by targeting specific groups of existing customers (i.e., customer segmentation) with messages and offers that are more likely to be relevant based on data about a particular set of behaviors. This leads to increased response rates, customer retention, customer satisfaction, and customer lifetime value (CLTV).

Each of these RFM metrics has been shown to be effective in predicting future customer behavior and increasing revenue. Customers who have made a purchase in the recent past are more likely to do so in the near future. Those who interact with your brand more frequently are more likely to do so again soon. And those who have spent the most are more likely to be big spenders going forward.

RFM analysis enables you to target customers with messages that best match their relationship with your brand. For example, you are likely to have more success suggesting big-ticket items to customers who spend frequently and in large amounts. On the other hand, you are more likely to grow the customer value of your relationships with consumers who make purchases frequently, but only in small amounts, by rewarding them for their loyalty or offering referral promotions.

How Does RFM Analysis Work?

Market research has traditionally concentrated on demographic and psychographic data, which marketers use to conduct customer segmentation. Those data points are then used to predict customer behavior across much larger populations that share the same set of traits. However, these methods depend on data from a small sample of consumers.

With the advent of systems like customer data platforms (CDPs) that help gather, unify and synthesize customer behaviors, marketers have much more granular data about the habits of individual customers to inform segmentation. Rather than segmenting customers only using demographic and psychographic data, marketers can create segments based on the real-world behavior of individuals, including purchase history across any channel (online or offline), browsing history, prior campaign responses and more. Unsurprisingly, this type of segmentation is called behavioral segmentation.

And even a basic CRM system can perform rudimentary tracking of the three easily quantifiable characteristics that contribute to RFM analysis:

- **Recency value:** This refers to the amount of time since a customer's last interaction with a brand, which can include their last purchase, a visit to a website, use of a mobile app, a "like" on social media and more. Recency is a key metric because customers who have interacted with your brand more recently are more likely to respond to new marketing efforts.
- **Frequency value:** This refers to the number of times a customer has made a purchase or otherwise interacted with your brand during a particular period of time. Frequency is a key metric because it shows how deeply a customer is engaged with your brand. Greater frequency indicates a higher degree of customer loyalty.
- **Monetary value:** This refers to the total amount a customer has spent purchasing products and services from your brand over a particular period of time. Monetary value is a key metric because the customers who have spent the most in the past are more likely to spend more in the future.

RFM Analysis for Customer Segmentation

Rather than analyzing the entire customer database, it's better to segment customers by characteristics like age or geography and separate them into a customer group. By engaging them in a well-segmented marketing campaign, you are able to create a relevant, personalized offer for a high-value customer.

Computing RFM for real-world application typically requires special analytical expertise or advanced math skills. And, like any model, RFM models can vary in complexity from simple to sophisticated. RFM segmentation begins by ranking customers in each of the three categories: recency score, frequency score and monetary score. Typically, this is done on a scale of 1 to 10. A 10 indicates the top 10% in each category (i.e., the most recent to transact, the most frequent to transact and those who purchased the most), a 9 the next 10% and so forth. By using a RFM scoring system such as this you can construct an effective marketing strategy by creating customer RFM segments, including:

- **Your best customers:** These are the customers who earn top scores in every category. They're loyal, willing to spend generously and likely to make another purchase soon. Such customers are primed to respond well to loyalty programs. They're more likely to be interested in new products you launch. And because they're committed to your brand and its products, it probably makes less business sense to offer them discount pricing. Instead, increase CLTV by suggesting big-ticket items and recommending products based on past purchases.
- **Your big spenders:** This customer segment is based on only one of the three metrics: customers with top scores for monetary value. Typically, marketers target this segment with luxury offers, higher subscription tiers and value-add cross-/upsells that

increase average order value. Again, it probably makes sense not to shrink margins by offering discounts.

- **Your loyal customers:** This is another customer segment that takes into consideration only one of the three metrics: customers with top scores for frequency. Despite making purchases often, they aren't necessarily your biggest spenders, so consider rewarding them with free shipping or similar offers. Advocacy programs and reviews can also be effective ways to engage these customers.
- **Your faithful customers:** Customers who score high for frequency but low in monetary value tend to respond best to product recommendations based on past purchases, as well as incentives tied to spending thresholds (e.g., a free gift for transactions above the brand's average order value).
- **Your at-risk customers:** Customers who have been in your top tier in the past (best, big spenders and/or loyal) but who now score low for recency and frequency present a special opportunity. Marketers should consider targeting them with messages aimed at retention, such as discount pricing, exclusive offers and new product launches. With the help of your CDP, you can even create specific customer journeys aimed at re-engaging and retaining at-risk customers.

Steps of RFM Analysis

The steps below provide a high-level overview of how an RFM Analysis and segmentation is executed.

Build RFM Model

In order to build an RFM model, you need to assign a recency score, frequency score and monetary score to each unique customer. The raw data, which can be collected from a customer database from previous transactions, is then compiled in a spreadsheet or database.

Divide the Customer Segment

Next, divide the RFM database into tiered groups for each of the three values of the RFM score. Tier designation is based on the greatest to the least. For example, tier one for monetary value is assigned to the high spenders and tier five is assigned to the lowest spenders.

Select the Targeted Customer Group(s)

The third step involves the selection of the segmented customer group with high customer value. Organizing the RFM segment, you can begin to assign titles to segments of interest, such as your best customers, biggest spenders, faithful customers and at-risk customers.

Craft a Personalized Marketing Strategy

Finally, craft a unique marketing strategy designed for each RFM segment focused on their behavioral patterns. Utilizing the RFM Analysis, marketers are able to effectively communicate their messaging to customers in a way aligned with customer behavior.

Why RFM is Effective for Small and Medium-Sized Businesses

For startups and smaller retailers with limited marketing resources, RFM analysis can be a particularly effective tool because of its:

- **Simplicity:** RFM analysis does not, on its own, require complex tools or sophisticated analytical capabilities. The principles are easy to understand and the results are easy to interpret and act on.
- **Affordability:** In many cases, it's possible for marketing professionals without advanced statistical or analytical training to perform RFM customer segmentation with only a standard spreadsheet.
- **Effectiveness in direct marketing:** RFM analysis, which grew out of database marketing and direct mail marketing, has been shown to be effective with relatively inexpensive digital direct marketing strategies that smaller brands can afford, such as an email marketing campaign.

Scaling RFM to the Enterprise

That said, as a business scales, you will also need technology that scales with the complexity and volume of interactions across all your channels, regions and more. With advanced RFM, you can create more authentic experiences at scale, using a range of customer traits as inputs to your model and going beyond scores and segments to achieve one-to-one personalization.

The most advanced enterprise-class CDPs serve as an engine for creating these types of RFM-driven experiences. They empower business users to orchestrate campaigns and journeys quickly and seamlessly leverage the full breadth and depth of all your customer data across any and all channels.

The Limits of RFM Analysis: What to Avoid

While RFM segmentation is powerful, it does have limits. When performed manually, it's prone to human error. RFM analysis is also based on just a few behavioral traits, lacking the power of the advanced predictive analytics now available.

Some businesses may use RFM analysis as an excuse to bombard high-ranking customers with messages and thus reduce response rates on campaigns that could otherwise be highly effective. On the other hand, it can cause marketers to neglect customers with low rankings even though many of them may be worth cultivating. For example, your RFM model may fail to account for the impact of past promotions or seasonality on RFM analysis. Likewise, a customer may have very little activity with your brand one month, yet be ready to engage in purchasing behavior the following month due to a birthday or anniversary.

How Relevant the RFM Model is Today

RFM analysis remains a perennial favorite of marketers. It's simple and intuitive, yet data-driven. It has the power to provide actionable insights down to the individual customer level — all without any input from data scientists or complex tools. That isn't to say you can't do sophisticated things with RFM analysis. For example, you can use RFM techniques to identify your best customers and turn them into a seed audience within an advertising platform that uses lookalike modeling to automatically identify prospects who share similar key traits.

Nevertheless, thanks to CDPs, marketers are now able to combine RFM data with other behavioral and demographic traits — everything from geolocation to recent products purchased — to create even more effective segmentation. Better yet, they can quickly and easily apply lookalike models and other sophisticated analytics to predict what messages are most likely to resonate and how and when those messages are most likely to prompt action.

With or without these more sophisticated approaches, marketers can use RFM analysis to:

- **Increase the effectiveness of email marketing campaigns:** Build an automated drip campaign with messages tailored to each segment.
- **Increase loyalty and user engagement:** Follow up with recent customers or new customers with timely promotions and educational content likely to increase their engagement with your brand.
- **Decrease churn:** Send personalized messages, offer repeat purchases at a discount or provide surveys that help you understand and address potential concerns.
- **Reduce marketing costs and increase ROI:** Reduce costs by focusing quickly and easily on smaller segments that are more likely to produce revenue and use insights from RFM analysis to optimize campaigns going forward.

What is Space Management?

It is the process of managing the floor space adequately to facilitate the customers and to increase the sale. Since store space is a limited resource, it needs to be used wisely.

Space management is very crucial in retail as the sales volume and gross profitability depends on the amount of space used to generate those sales.

Optimum Space Use

While allocating the space to various products, the managers need to consider the following points –

- Product Category –
 - **Profit builders** – High profit margins-low sales products. Allocate quality space rather than quantity.
 - **Star performers** – Products exceeding sales and profit margins. Allocate large amount of quality space.
 - **Space wasters** – Low sales-low profit margins products. Put them at the top or bottom of shelves.
 - **Traffic builders** – High sales-low profit margins products. These products need to be displayed close to impulse products.
- Size, shape, and weight of the product.
- Product adjacencies – It means which products can coexist on display?
- Product life on the shelf.

Retail Floor Space

Here are the steps to take into consideration for using floor space effectively –

- Measure the total area of space available.
- Divide this area into selling and non-selling areas such as aisle, storage, promotional displays, customer support cell, (trial rooms in case of clothing retail) and billing counters.

- Create a **Planogram**, a pictorial diagram that depicts how and where to place specific retail products on shelves or displays in order to increase customer purchases.
- Allocate the selling space to each product category. Determine the amount of space for a particular category by considering historical and forecasted sales data. Determine the space for billing counter by referring historical customer volume data. In case of clothing retail, allocate a separate space for trial rooms that is near the product display but away from the billing area.
- Determine the location of the product categories within the space. This helps the customers to locate the required product easily.
- Decide product adjacencies logically. This facilitates multiple product purchase. For example, pasta sauces and spices are kept near raw pasta packets.
- Make use of irregular shaped corner space wisely. Some products such as domestic cleaning devices or garden furniture can stand in a corner.
- Allocate space for promotional displays and schemes facing towards road to notify and attract the customers. Use glass walls or doors wisely for promotion.

Store Layout and Design

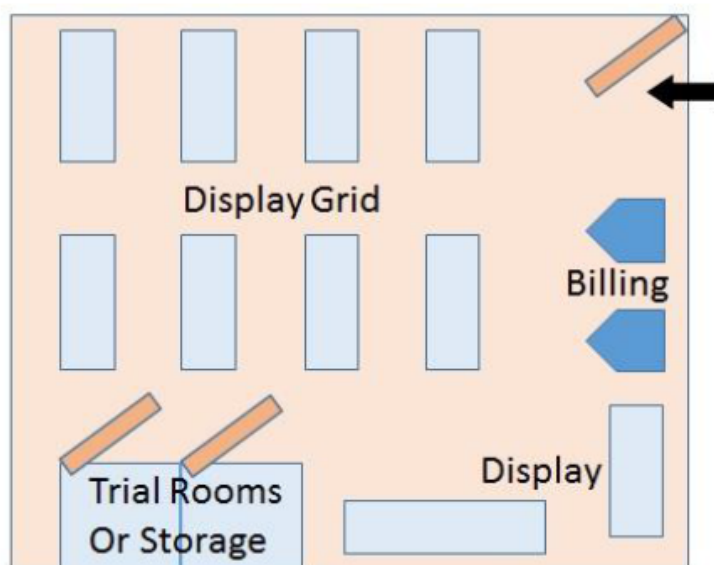
Customer buying behavior is an important point of consideration while designing store layout. The objectives of store layout and design are –

- It should attract customers.
- It should help the customers to locate the products effortlessly.
- It should help the customers spend longer time in the store.
- It should motivate customers to make unplanned, impulsive purchases.
- It should influence the customers' buying behavior.

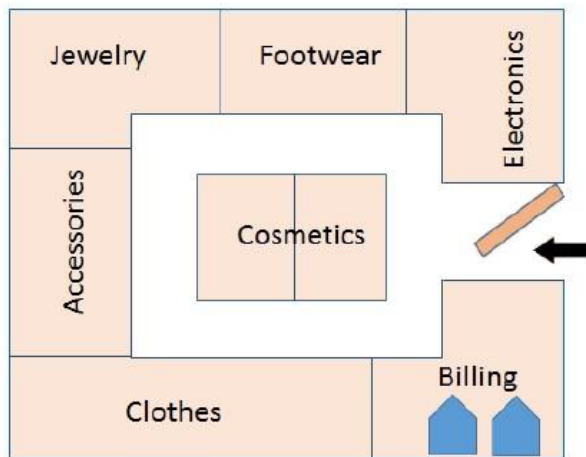
Store Layout Formats

The retail store layouts are designed in way to use the space efficiently. There are broadly three popular layouts for retail stores –

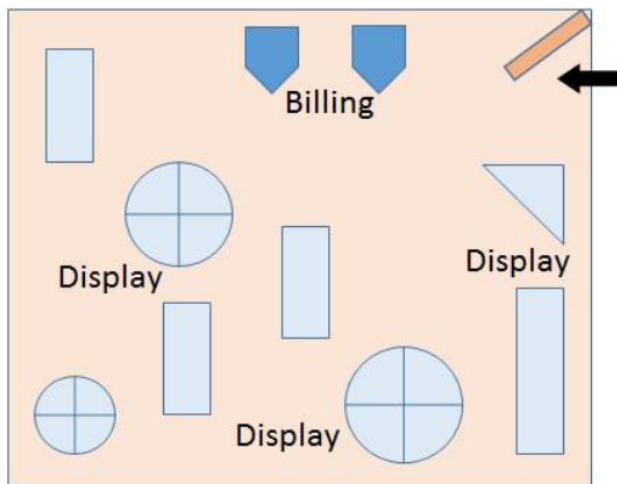
Grid Layout – Mainly used in grocery stores.



Loop Layout – Used in malls and departmental stores.



Free Layout – Followed mainly in luxury retail or fashion stores.



Store Design

Both internal and external factors matter when it comes to store design.

Interior Design

The store interior is the area where customers actually look for products and make purchases. It directly contributes to influence customer decision making. It includes the following –

- Clear and adequate walking space, separate from product display area.
- Free standing displays: Fixtures, rotary displays, or mannequins installed to attract customers' attention and bring them to the store.
- End caps: These displays at the end of the aisles can be used to display promotional offers.
- Windows and doors can provide visual messages about merchandise on sale.
- Proper lighting at the product display. For example, jewelry retail needs more acute lighting.

- Relevant signage with readable typefaces and limited text for product categories, for promotional schemes, and at Point of Sale (POS) that guides customers' decision-making process. It can also include hanging signage for enhancing visibility.
- Sitting area for a few differently abled people or senior citizens.

Exterior Design

This area outside the store is as much important as the interior of the store. It communicates with the customer on who the retailer is and what it stands for. The exterior includes –

- Name of the store, which tells the world that it exists. It can be a plain painted board or as fancy as an aesthetically designed digital board of the outlet.
- The store entrance: Standard or automatic, glass, wood, or metal? Width of the entrance.
- The cleanliness of the area around the store.
- The aesthetics used to draw the customers inside the store.

advertising, the techniques and practices used to bring products, services, opinions, or causes to public notice for the purpose of persuading the public to respond in a certain way toward what is advertised. Most advertising involves promoting a good that is for sale, often through brand marketing, but similar methods are used to encourage people to drive safely, to support various charities, or to vote for political candidates, among many other examples. In many countries advertising is the most important source of income for the media (e.g., newspapers, magazines, or television stations) through which it is conducted. In the noncommunist world advertising has become a large and important service industry.

In the ancient and medieval world such advertising as existed was conducted by word of mouth. The first step toward modern advertising came with the development of printing in the 15th and 16th centuries. In the 17th century weekly newspapers in London began to carry advertisements, and by the 18th century such advertising was flourishing.

The great expansion of business in the 19th century was accompanied by the growth of an advertising industry; it was that century, primarily in the United States, that saw the establishment of advertising agencies. The first agencies were, in essence, brokers for space in newspapers. But by the early 20th century agencies became involved in producing the advertising message itself, including copy and artwork, and by the 1920s agencies had come into being that could plan and execute complete advertising campaigns, from initial research to copy preparation to placement in various media.

Advertising developed in a variety of media. Perhaps the most basic was the newspaper, offering advertisers large circulations, a readership located close to the advertiser's place of business, and the opportunity to alter their advertisements on a frequent and regular basis. Magazines, the other chief print medium, may be of general interest or they may be aimed at specific audiences (such as people interested in outdoor sports or computers or literature) and offer the manufacturers of products of particular interest to such people the chance to make contact with their most likely customers. Many national magazines publish regional editions, permitting a more selective targeting of advertisements. In Western industrial nations television and radio became the most pervasive media. Although in some countries radio and

television are state-run and accept no advertising, in others advertisers are able to buy short “spots” of time, usually a minute or less in duration. Advertising spots are broadcast between or during regular programs, at moments sometimes specified by the advertiser and sometimes left up to the broadcaster. For advertisers the most important facts about a given television or radio program are the size and composition of its audience. The size of the audience determines the amount of money the broadcaster can charge an advertiser, and the composition of the audience determines the advertiser’s choice as to when a certain message, directed at a certain segment of the public, should be run. The other advertising media include direct mail, which can make a highly detailed and personalized appeal; outdoor billboards and posters; transit advertising, which can reach the millions of users of mass-transit systems; and miscellaneous media, including dealer displays and promotional items such as matchbooks or calendars.

What is advertising effectiveness?

Advertising is a major source of revenue for businesses. Advertising effectiveness measures how well a marketing or advertising campaign did and how well it met the company’s goals. It is very important if the company wants to get a good return on investment (ROI).

An effective advertising campaign can increase sales, attract new customers, and enhance brand perception. Measuring ad effectiveness allows you to understand the impact and reach of your campaign, allowing you to determine the ideal amount of exposure and what is and is not working with your advertising strategies.

Importance of advertising effectiveness

Advertisement is important for any business, and measuring ad effectiveness is important to know how well your campaign is doing. Let’s discuss some importance of ad effectiveness measurement below:

- Measuring advertising effectiveness helps in identifying ineffective advertisements and campaigns. It makes it easier to change advertising at the right time, which makes advertising more focused on customers and results. As a result, ineffective advertising can be avoided.
- Measuring ad effectiveness provides advertisers with helpful information to take corrective action against ineffective advertisements.
- Advertisers are doubtful about campaign success. Evaluating advertising effectiveness aids in predicting results and avoiding total loss.

We learned the importance of ad effectiveness. Now it’s time to get into the next section, where we will discuss how to measure it.

How to measure advertising effectiveness?

There are several ways to measure how well an advertising campaign works. Let’s find them out below:

- Set a specific goal

Setting a clear goal for your advertising effectiveness is essential for measuring its success. What does it mean for your advertising to be effective for your company? It could be to track the conversions and sales of a campaign or the effect on brand recognition following an advertising campaign. You have absolute freedom of choice.

For example, if your goal is to get 20% more Instagram followers, it's much easier to measure than if your goal is just to get more social media followers.

- Analyze site traffic

Usually, a successful advertising campaign will lead to more people visiting a site. Customers who are interested in doing business with a company research its website.

Compare site traffic before and after your advertising campaign to see if more people visit your site. You can use different analytical tools to get daily, weekly, and monthly reports on site traffic.

- Check lead quality

Lead quality refers to how likely a lead will turn into a customer. The better the quality of the lead, the more likely it is that you will get a new customer. A lead's quality can be measured in a few ways:

1. Check the types of pages people visit. For example, see how many product pages they look at compared to blog posts.
2. Check how long people look at each page. Do they look at your website for seconds or minutes?
3. Learn how people found the page. Did they come across it via a search engine or social media?

When you concentrate on lead quality, you can increase the likelihood of converting a lead into a sale.

- Compare and contrast key metrics

It is important to know the context to figure out advertising effectiveness. When you have clear pre-campaign metrics to use as a baseline, you can see what worked and what didn't in your campaign. And to understand your post-campaign performance, you must examine how you performed before the campaign began.

- Survey testing

Another important indicator for measuring advertising effectiveness is survey testing. Getting survey data gives important information about how well an advertising campaign is working. When you ask your audience what they think about your advertising campaign, you can ask them specific questions that will help you.

Survey data can help understand the success of advertising campaigns. When you survey your audience about your advertising campaign, you can ask specific questions that help you:

1. Identify how many people saw your ad.
2. Learn what viewers thought of the advertisement.
3. Find out whether these potential leads remember your brand.

Following these metrics, you can measure your organization's advertising effectiveness. QuestionPro survey software can also help you conduct surveys with its versatile features.

What's the difference between PPC, SEM and SEO?

Though these three terms get used interchangeably, there is a difference between PPC, SEM (search engine marketing), and SEO (search engine optimization).

SEM is an umbrella term that encompasses PPC but is not limited to only this form of advertising. It references activity that intends to improve how easy it is to find a website through a search engine. SEM is both paid and unpaid, PPC, or organic traffic (SEO).

PPC is online advertising that works with search engines and other channels such as video ads (YouTube) and image ads (Instagram/Facebook).

Search engine optimization (SEO), is a method of optimizing a website's content and structure to make it more visible to search engines. This is done by researching and using relevant keywords, optimizing meta data, creating quality content, and earning links from other websites. The goal of SEO is to improve a website's organic (non-paid) search engine rankings and drive traffic to the website through organic search results.

How does PPC work?

PPC advertising works by allowing advertisers to bid on specific keywords or phrases that they want their ads to appear for in search engine results. When a user searches for one of those keywords or phrases, the advertiser's ad will appear among the top results. The advertiser is then charged a fee each time a user clicks on their ad.

Advertisers create campaigns that target specific demographics, interests, locations, etc. They will set a maximum bid for the keywords they want to target.

The search engine will then use a complex algorithm to determine which ads to show and in what order. The algorithm takes into account factors such as the:

- Advertiser's bid amount
- Relevance of the ad to the keyword

- Quality of the ad
- PPC strategy and campaign planning
- Top PPC platforms
- How to learn PPC

This form of advertising can also be done through social media platforms, such as Facebook and Instagram.

Why is PPC important?

PPC should be considered an asset, not a marketing expense.

In 2022, PPC brought in an average of \$2 for every \$1 spent, with an average cost per click (CPC) of \$1.16. And while social media is still a popular place to advertise, 40% of ad spend in 2020 was spent on search (73% of that going to Google).

PPC offers several benefits not found with SEO or social media, including:

- **Quick results:** PPC advertising can drive traffic to a website almost immediately, whereas SEO can take time to show results. Platforms usually approve ads the same day, providing maximum exposure almost immediately. This could be a text ad via Google search, an image ad through Instagram, or even a video featured on YouTube. Using multiple platforms in different formats can increase your brand's visibility.
- **Reach your targeted audience:** PPC advertising allows marketers to target specific demographics, interests, and location, which helps to reach the right audience. You can even target individuals based on their behaviors and interests; social media sites like Facebook can help you get your ad to the group that's likely to convert into a sale.
- **Measurable:** PPC advertising provides measurable results. It allows marketers to track conversions, return on investment (ROI), and other key performance indicators (KPIs).
- **Cost-effective:** PPC advertising can be more cost-effective than traditional advertising methods, such as television or print ads, since marketers only pay when a user clicks on their ad, and they can set a budget for their campaign.
- **Branding:** PPC advertising can help to increase brand awareness. Even if users don't click on the ad, they may still see it and remember the brand.
- **Complementing SEO:** PPC can be used to supplement SEO efforts. While SEO focuses on increasing organic traffic, PPC can be used to drive immediate traffic to a website while SEO efforts are still ongoing.
- **Track your goals:** Tools such as Google Analytics can help you track your goals. See how your ads are performing in real-time, and decide what needs to get done to reach your goals more efficiently.

- **Reputation management:** PPC can be used to bid on keywords matching a reputation event and directed to a landing page directly addressing the matter so you can control the narrative, instantly and professionally.

Overall, PPC advertising offers a cost-effective and measurable way to reach a targeted audience, generate leads and sales, and ultimately increase brand awareness.

What is important for PPC strategy and campaign planning?

When planning a PPC campaign, there are several key steps you should take:

- **Define your target audience:** Identify the demographics of the people you want to reach with your ads, including their age, gender, location, interests, and more.
- **Set clear goals:** Determine what you want to achieve with your PPC campaign, such as increasing website traffic, driving online sales, or generating leads.
- **Research keywords:** Use keyword research tools to identify the terms and phrases your target audience is searching for, and include them in your ad copy and website content.
- **Create compelling ad copy:** Write attention-grabbing headlines and descriptions for your ads that will entice people to click through to your website.
- **Choose the right ad platforms:** Decide which platforms you want to advertise on, such as Google Ads, Microsoft Advertising, Meta Ads (for Facebook and Instagram), and so on.
- **Monitor and optimize your campaign:** Track the performance of your ads and make adjustments as needed to optimize your campaign and achieve your goals.
- **Test different ad formats and targeting options:** Try different ad formats (like text, image and video) and experiment with different targeting options to see what works best for your campaign.
- **Set a budget:** Decide how much you want to spend on your campaign and make sure you stick to your budget.

What are the top PPC advertising platforms?

Several popular platforms offer PPC advertising solutions. Google, Microsoft Bing and Facebook are among the most popular.

Different types of ad platforms can show various results in the form of search, display, remarketing, and video (on YouTube or Facebook/Instagram Reels).

For the sake of brevity, we'll focus on the two programs that stand out the most and cover all ad types: Google and Facebook.

Google Ads

Google reigns supreme among search engines. Its global popularity is unmatched. That's why the fees are higher for Google Ads' paid advertisements.

Advertisers bid to have their ad displayed, their services offered, a product listed, or a video featured on Google. There is an option to display ads on mobile apps, videos, and non-search websites (search partners).

Google Ads is the largest pay-per-click platform. With Google processing 99,000+ search inquiries per second, there's a great chance that your ad will get seen by your intended audience, resulting in a customer/profit. Google Ads is perfect for Fortune 500 companies and small businesses alike.

Other helpful resources from Google Ads:

- [Google Ads Help](#)
- [Your guide to Google Ads](#)

YouTube

YouTube ads are a form of online advertising that allows businesses and individuals to promote their products or services on the YouTube platform. These ads can take several different forms, including:

- **Skippable video ads:** These ads can be skipped after a certain amount of time, typically five seconds. They can be up to 60 seconds long.
- **Non-skippable video ads:** These ads must be watched in full before the main video can be viewed. They can be up to 15 seconds long.
- **Bumper ads:** These are short, non-skippable ads that are six seconds or shorter in duration.
- **Sponsored cards:** These are small cards that appear on the video screen during the video and contain extra information about the product or service being advertised.
- **Overlay ads:** These are semi-transparent ads that appear on the lower portion of the video.

Advertisers can target specific audiences based on factors such as demographics, interests, and behaviors. YouTube ads can be purchased on a cost-per-view (CPV) or cost-per-click (CPC) basis, and the advertiser is charged each time the ad is viewed or clicked on.

Facebook Ads

Facebook ads allow businesses and organizations to promote their products or services on the Facebook platform. The ads appear in the news feed of Facebook users, the right-hand column of the desktop site and the Stories section on mobile.

Types of Facebook ads include:

- **Image and video ads:** These ads consist of a single image or video, along with a short headline and a call-to-action button.
- **Carousel ads:** These ads allow businesses to showcase multiple images or videos in a single ad. Users can scroll through the images or videos to learn more about the products or services being advertised.
- **Slideshow ads:** These ads allow businesses to create a video-like experience using multiple still images.
- **Instant Experience ads:** These ads allow businesses to create immersive, full-screen experiences within the Facebook app.
- **Collection ads:** These ads allow businesses to showcase multiple products within a single ad, with a link to a full-screen view of the products.

Advertisers can create campaigns that target specific demographics, interests, and locations. Facebook's algorithm uses this information to show the ads to the users who are most likely to be interested in the products or services being advertised.

Instagram Ads

Instagram Ads allow businesses and individuals to promote their products or services on the Instagram platform. These ads are displayed in the form of sponsored posts, which are seamlessly integrated into users' newsfeeds and look similar to regular posts.

Instagram offers several different types of ads, including:

- **Photo ads:** These ads use a single image to promote a product or service.
- **Video ads:** These ads use a short video to promote a product or service.
- **Carousel ads:** These ads allow businesses to feature multiple images or videos in a single ad, allowing users to swipe through them.
- **Stories ads:** These are ads that appear in the Stories section of Instagram and disappear after 24 hours.
- **IGTV ads:** These are ads that appear before an IGTV video starts playing.

Advertisers can target specific audiences based on factors such as demographics, interests, and behaviors. Instagram ads can be purchased on a cost-per-thousand-impressions (CPM) or cost-per-click (CPC) basis, and the advertiser is charged each time the ad is viewed or clicked on.

Microsoft

Microsoft Advertising, previously known as Bing Ads, is an advertising platform that enables businesses and individuals to create and run ads on the Microsoft Bing search engine and the

Microsoft Advertising Network, which is a collection of websites and apps that partner with Microsoft to show ads.

Advertisers can use the platform to create different types of ads such as search ads, product ads, shopping ads, display ads and video ads. These ads are targeted to specific audiences based on demographics, interests, and behaviors and can be purchased on a pay-per-click or pay-per-impression basis. This means that the advertiser pays each time an ad is clicked on or viewed.

TikTok

TikTok ads allow businesses and individuals to promote their products or services on the TikTok app. These ads are designed to be engaging and creative, and they're often set to music or include popular TikTok trends and challenges.

TikTok offers several different types of ads, including:

- **In-feed ads:** These are full-screen ads that appear in the main feed of the app and can be either video or image-based.
- **Brand takeover ads:** These are full-screen ads that appear when a user opens the app, and they can be either video or image-based.
- **Hashtag challenge ads:** These ads encourage users to participate in a branded hashtag challenge and submit their own videos using the branded hashtag.
- **Branded effects:** These are special effects that are created by brands and can be used by users in their own videos.

Advertisers can target specific audiences based on factors such as demographics, interests, and behaviors. TikTok ads can be purchased on a cost-per-thousand-impressions (CPM) or cost-per-click (CPC) basis, and the advertiser is charged each time the ad is viewed or clicked on.

Additionally, TikTok offers a self-service platform for small and medium-sized businesses and a managed service for larger businesses to run their campaigns.

LinkedIn

LinkedIn ads let businesses and individuals promote their products or services on the LinkedIn platform. These ads are designed to reach a professional audience, and they're often used to generate leads, build brand awareness and promote job openings.

LinkedIn, which is owned by Microsoft, offers several different types of ads, including:

- **Sponsored content:** These ads appear in users' newsfeeds and look similar to regular posts. They can be in the form of text, images, or videos.

- **Sponsored InMail:** These ads are sent directly to users' inboxes.
- **Sponsored jobs:** These ads promote job openings and appear at the top of the jobs section of the platform.
- **Display ads:** These are banner ads that appear on the right side of the platform and can be targeted to specific audiences.
- **Dynamic ads:** These are ads that automatically generate personalized content for each user based on their browsing history.

Advertisers can target specific audiences based on factors such as demographics, job title, company size, industry, skills, and behaviors. LinkedIn ads can be purchased on a cost-per-click (CPC) or cost-per-thousand-impressions (CPM) basis, and the advertiser is charged each time the ad is clicked or viewed.

LinkedIn also offers a self-service platform for small and medium-sized businesses and a managed service for larger businesses to run their campaigns.

Twitter

Twitter ads allow businesses and individuals to promote their products or services on the Twitter platform. These ads are designed to reach a wide audience and are often used to generate leads, build brand awareness, and increase website traffic.

Twitter offers several different types of ads, including:

- **Promoted tweets:** These are tweets that are labeled as "promoted" and appear at the top of users' timelines or search results pages. They can be in the form of text, images, or videos.
- **Promoted accounts:** These are ads that promote a Twitter account and appear in the "who to follow" section of the platform.
- **Promoted trends:** These ads promote a specific hashtag and appear at the top of the trending topics list.
- **Website cards:** These ads promote a website or landing page and include an image, title, and description.
- **App install cards:** These ads promote mobile apps and include an image, title, and description.

Advertisers can target specific audiences based on factors such as demographics, interests, and behaviors. Twitter ads can be purchased on a cost-per-engagement (CPE) or cost-per-click (CPC) basis, and the advertiser is charged each time the ad is engaged with (like, retweet, reply, etc) or clicked on.

Twitter also offers a self-service platform for small and medium-sized businesses and a managed service for larger businesses to run their campaigns.

What are the types of PPC ads?

Search

Search pay-per-click ads are the most popular type of PPC ads. A search ad appears at the top of search engine results pages (SERPs) when a user enters a specific query (keyword or phrase) into a search engine (Google and Microsoft Bing being the most popular). These ads are typically text-based and are designed to be highly relevant to the user's search.

Advertisers typically pay each time a user clicks on one of their ads (the cost of each click is known as CPC or cost per click). Search ads are the most popular way for businesses to promote their products or services and drive traffic to their websites.

Display

A display ad is a type of ad that appears on websites, apps, and other digital platforms, typically in the form of a banner or other graphical format. Display ads are designed to be visually appealing and can include a variety of media such as images, videos, and interactive elements.

Display ads are often used to raise brand awareness, promote products or services, or drive traffic to a website. Display ads are typically purchased on a cost-per-impression (CPI) or cost-per-thousand-impressions (CPM) basis, meaning that the advertiser pays each time the ad is displayed a certain number of times.

Video

A video ad uses video content to promote your product, service, or brand. These ads can appear on various platforms, including social media (reels or posts), streaming services such as YouTube, and websites. Video ads on YouTube can be pre-roll, mid-roll, or post-roll ads, meaning they can appear before, during or after a video. Video ads can be skippable or non-skippable.

Video ads are usually interactive and have clickable elements such as calls-to-action, links or forms. They are usually purchased on a cost-per-view (CPV) or cost-per-click (CPC) basis, where the advertiser pays each time the ad is viewed or clicked on.

Remarketing (or retargeting)

Remarketing is a form of advertising that allows businesses to show ads to users who have previously interacted with their website or mobile app. Remarketing ads are typically shown to users as they browse other websites, or as they use mobile apps, and are designed to remind the user of the business and encourage them to return to the website or app.

Remarketing ads can be delivered in various formats, such as display ads, search ads, video ads, and social media ads. They are usually purchased on a cost-per-click (CPC) or cost-per-thousand-impressions (CPM) basis.

Remarketing campaigns are highly targeted and effective at driving conversions and sales. They work by tracking users' behavior on a website or mobile app, then using that data to show them targeted ads as they browse other websites or use other apps. This is done by placing a cookie or pixel on the user's browser or device, which is then used to identify them and serve them relevant ads.

Other ad types

Additional ad types are covered under one of the above categories, but have different characteristics such as the type of business allowed to use it and set up requirements. These include:

- Remarketing Lists for Search Ads (RLSAs)
- Performance Max
- Local Search Ads (LSAs)

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