Everything You Need To Know About Demand Forecasting And Planning

Table of contents

In today's competitive world, if you want to book profits, better forecast them! Every commercial pursuit needs strategic planning of its operations, and the accuracy of this planning defines its survival. The businesses are now focused on performing better in the consumer-driven markets. Hence, predicting demands before they arise can give them both an edge over their rivals and access to crucial resources for tapping the opportunities. In this article, I am going to discuss demand forecasting and planning in a nutshell. We will understand all the relevant terminologies, and at the end of the article, I expect that every reader will associate its importance in their business.

Conceptual Understanding

Don't Count Your Chickens Before They Hatch -Aesop

I am a big fan of Stoicism, but I think that it's high time that we move on from this Greek principle. The biggest nightmare of any business today is to sit on a pile of production-ready resources and see them idle. Or even worse- scrapping them due to the absence of demand. Thus, accurately estimating the shifts in customer sentiments and other factors contributing to the industry is a basic necessity. It holds existential relevance to the profitability and survival of the firms. So, if you are willing to keep your firm financially healthy and ensure sustainability in the longer horizon, you have to count your chickens way before they hatch. Plain and simple as that.

If you know where demand is heading and what are the evolving circumstances, it is only then that you can act sensibly. In the absence of sales forecasting and planning, the entire business strategy is reduced to mere guesswork and personal opinions from decision-makers. Due to this reason, the need for a scientific approach to solve this problem was required. These areas are now one of the most vital elements of industrial engineering and also form a major part of operations research.

Why Businesses Forecast Demand: More Crucial Than Ever Before

Demand Forecasting is the scientific process of estimating the future demand for products in terms of quality, quantity, and driving factors. It also encompasses the desired features and suitability for its intended use. The use of end results generated from forecasting is done to calibrate the business processes and set targets for the sales teams. They will use the expected market demands to establish a performance benchmark, and this, in turn, creates goals for various teams, including manufacturing and support divisions. Planning includes measures to meet a particular set of situations so as to serve the company's interests in the best way. They can be either positive or negative in nature.

I am listing down some of the most significant reasons to include them as a core business process below:

- It helps in devising sales and marketing plans along with their respective budgets.
- They also lay down the foundation for the master budget of the company.
- The data available from these exercises will give insights to the required plant capacity to meet the targets.
- It also contributes to the pricing strategy.
- It suggests the type of equipment required, production processes, types of products, and components along with the volume of production.
- It also helps in devising procurement strategy by understanding the consumption of various raw materials and supply chain management.

Key Elements

The entire data is collected in these three key elements, which serve as a basis for the analytical studies. They are:

1. Cycles
2. Trends
3. Variations
    a. Seasonal
    b. Random

A cycle is a short term behavior of demands that occurs on a definite time interval. It is usually described by an increase and decrease within time-bound periods.

The trend is a relatively large phase that depicts the overall change in the future. It is formed by shifts in customer sentiments. It is also influenced by the concurrent conditions like government policies.

Variations are classified into two broad types: Seasonal and Random. Seasonal variations are experienced during the same period of the year every time. Random variations are event-specific. For example, the demand for iron during a war or acute decrease of luxury items during the same time are suitable examples of random variations. They don't occur in a predictable fashion, and they are not time-bound events.

All of them serve as measures of economic behavior relative to time frames for providing an accurate, easy-going, and widely relevant statistical model of any given situation. These mathematical models can generate a roadmap for the future course of action.

Which Inputs Are Required From Within And Outside The Organization

You will mainly require the following inputs for sales forecasting and planning functions in your organization:

1. From within the organization

- Past sales figures
- Production capacity
- Warehouse capacity
- Human resources
- Suppliers' data
- Logistic partners' data

2. From outside the organization

- Government policies
- War situations
- Socio-political conditions
- Changes in the economy
- Changes in the earning power of your customers
- The purchasing power of the currencies that your firm deals in

Popular Sales/Demand Forecasting Methods Used In The Industry

Today, industrial engineers play an essential role in the decision-making process by sharing valuable insights to setting sales benchmarks. These figures are generated by computing large sets of data. Usually they are divided into qualitative and quantitative methods. Here, I will divide these methods into three main categories for making them easy to understand:

Non-statistical models:

They lean more towards the intuitive directions of the people who are a part of the business for a considerable amount of time. In this approach, they estimate the demand-supply relationships for goods with the help of indicators like competitor movement, government policies, and changes in prices of raw materials. They are as follows:

Historic estimate

Historic estimation is the most simple of these. It goes by the logic that if we sold 1200 units of soda dispenser last summer, we would at least sell 1200 units this time too. It has a plethora of limitations, and thus, it is rarely used. This requires everything from the economy to technological advances to remain static. It is not advisable to use this technique.

Sales force estimate

Sales force estimate is used by firms dealing in highly specialized markets with a small number of clients and lower product volume. This includes sectors like defense equipment, heavy engineering, and aviation. It uses the information given by the company's sales department since they are nearest to the market. The field sales reps approach the clients directly and also give their narratives to their seniors. After gathering information from various territories and channels, the prediction is made.

Delphi method

Delphi method, as the name depicts, uses the opinions by a panel of experts. All of them discuss their insights through questionnaires and reach a consensus to build an actionable plan.

Judgemental techniques

Judgemental techniques employ questionnaires to get the opinion of the customers. This includes a multitude of questions regarding their expectations, options, pricing, features, and overall likeness to buy.

Prior knowledge

Prior knowledge is used for internal purposes. After the budgeting is completed, work plans are issued to respective departments to ensure maximum predictability.

Models with semi-mathematical modeling:

With the increasing importance of backing opinions with figures, these methods became mainstream. Usually, small firms with average product-client volumes can use them to get better results. They are listed below:

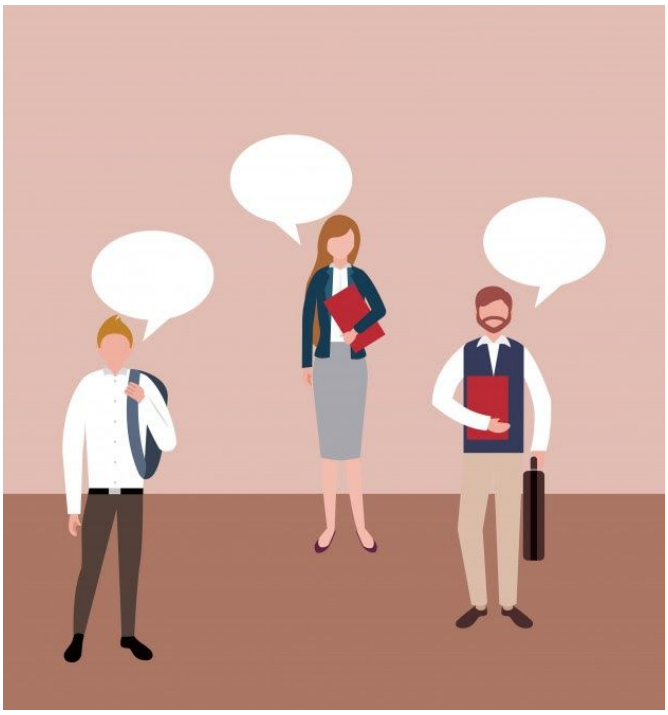
Econometric forecasting

Econometric forecasting is applicable to businesses that have a considerable client base. Mostly, the organizations using this method drive revenue out of the disposable incomes of their clients. Some of the good examples of this include telcos, FMCG, and consumer electronics. For instance, if the average income increases by 12%, then an estimated increase of 18% in disposable income is expected. This, in turn, may translate to a 7% increase in the purchase of particular products.

Time series analysis

Time series analysis utilizes sales figures from the past to predict future trends. The quantity of sold items in the previous years is marked on the Y-axis, while the time period is marked on the X-axis. The graph plotted at the end is used to generate sales projections. It is necessary to have data for a very long range for getting reliable results through this technique.

Market survey



Market Survey is used primarily for testing acceptance and product introductions. For example, a company circulates new features or solutions to limited clients. Mostly, they are either random customers or brand loyalists. Their suggestions and acceptance will give an idea regarding probable success chances.

Purely statistical models

A majority of organizations experience the need for advanced methods after they reach a specific maturity as a business. Therefore, they opt for highly sophisticated techniques for making accurate and reliable predictions on a regular basis. It also requires the use of technological solutions since the volume of inputs and parameters is pretty high. They are as mentioned below:

Past average

It is a relatively simple metric where the total sales during the given periods are divided by the total number of periods considered. If the sales during five years are A, B. C, D, and E; the past average is calculated by calculating its mean:

Past average = (A+B+C+D+E)/5

Last period sales

This is a slightly advanced version as it includes an accuracy check of the estimates made. This helps in understanding the possible fluctuations in the actual outcomes. The deviations are used to make changes in the data for making them more dependable.

Moving average

Both of the above-mentioned methods have their limitations as they don't consider fluctuations and data together. Moving average compensates the changes in the external conditions by taking a combined average of different time frames. This saves us from giving importance to only new or only old datasets. The trends shall neither include seasonal nor secular fluctuations when this method is employed.

Exponential smoothing

Exponential smoothing is far more effective than the moving average method. It emphasizes more on the recent trends while including the overall scenario prevailing in the past. The weight allocated is denoted by **α** (alpha.) The mathematical expression of alpha is given by:

α=2(N+1), where N = number of periods.

New forecast = (α)*(last actual sales) +((1-α)*(corresponding forecast))

Therefore, the dependency on too old data is reduced without reducing the stability of the estimations.

Correlation analysis

It is used to quantify the relationship between sales and a particular phenomenon. This can be anything ranging from government policies or changes in the socio-political horizon. You need to devise a credible relationship between such instances as monsoon triggering sales of raincoats or umbrellas.

Linear regression analysis

When you don't have any inputs regarding the past, linear regression comes handy. The empirical relationship is modified as per the accuracy of the predictions made. The factors used shall create the demand or at least control it.

Scope Of BI Tools In Demand Forecasting

All of the techniques we saw above are easy to understand, but actual calculations cannot be done manually. It was possible to do so in the past because the number of competitors, changes in conditions, solution diversity, and volatility was minimal. Today, the scenario has changed drastically. Thus, every business is moving towards technology-based solutions to cope up with the latest developments. Modern business intelligence tools will redefine the situation as they can handle computations for an enormous range of information. BI tools also use state of the art technologies like Artificial Intelligence, Deep Learning, and Big Data Analytics.

I am listing down the areas where they can contribute to your growth:

- Lay down the plan for master budgeting.
- Recognize the strengths and weaknesses of the existing infrastructure in hypothetical situations.
- Help in devising procurement strategy along with coordinating with the logistics partners.
- It gives you insights regarding calibrating your inventory management system as per the projected demand.
- Sales projections are made on the basis of the demand from the market and the company's ability to fulfill them.
- Staffing becomes easy as the HR team has enough time to source candidates.
- Forecasting also provided insights regarding the need for expansion of current capacity.
- Sales forecasts form the basis of inter-department planning, which also includes guidelines for the ancillary departments of the organization.

Refining The Supply Chain Management With Demand Forecasting

It is the process of planning the utilization and response of the supply chain against the sales forecasts. It emphasizes on recalibrating the inventory levels to meet the expected fluctuations. This also includes setting up additional infrastructure and modifying it. In many cases, firms have to supply certain products in much larger volumes and descale others. Thus, apart from the machinery, human resources are also trained in advance for coping up with the changes.

Apart from these functions, demand planning also works in close coordination with the pricing and marketing teams. Many times, decisions regarding product bundling are made to ensure better profitability and clearing old stock. Many firms also include product modifications within the scope of demand planning. It is done because alterations in many items can improve their saleability or even open the doors to newer markets. Hene demand planning is an integrated function that, along with sales forecasting, helps in the continuous optimization of the organization. It also ensures that budgeting is appropriately done, and any shortcomings are met with adequate measures.

In essence, it refines the supply chain management of an organization. The responsiveness and ability to comply with the demands are the primary areas where demand planning aids businesses.

How Demand Planning Defines Success In Adversaries And In Encashing Bullish Trends

Having a roadmap is one of the biggest assets any commercial entity can have in these times. Being ready for what might happen after two quarters will not only help in encashing opportunities but also save you from adversaries. In times of non-suitable conditions, scaling down, clearing inventory, hedging, decreasing liabilities, and refining cash flow prove to be boons.

> Fact Time: Do you know that Warren Buffet's Berkshire Hathaway is holding more $122 billion in cash? The oracle of Omaha is preparing for another crash, and he's been planning for it for the past couple of years. (Source: Bloomberg)

This is one of the best contemporary examples of acting as per the future scenario. On the contrary, if you have information regarding the surge in the requirement of particular merchandise, it can prove to be a blessing in disguise as well. An excellent example of this comes from Crocs Inc. They predicted the market for their new footwear merchandise and bought the rights for the raw materials. As a result, they carved their niche on the global landscape while competing with much larger competitors.

Sales forecasting is also used to plan for specific triggers that could generate immediate demands. This also includes planning the production process and keeping suppliers on standby. Failing to act swiftly will leave you in either deep losses or losing once in a lifetime opportunities.

Over To You

> "Give me six hours to chop down a tree, and I will spend the first four sharpening the axe" -Abraham Lincoln.

As we saw in this article, the ability to predict is becoming more of a business necessity than ever before. I also find that the major corporations across the globe are focusing heavily on understanding the subtle dynamics of sales to be at the top of their game. It is not only limited to more prominent entities as the availability of software solutions to small enterprises have leveled the game even for all. Sales forecasting and demand planning will gain more ground in the days to come as keys to book profits. Do share your thoughts in the comments section.

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