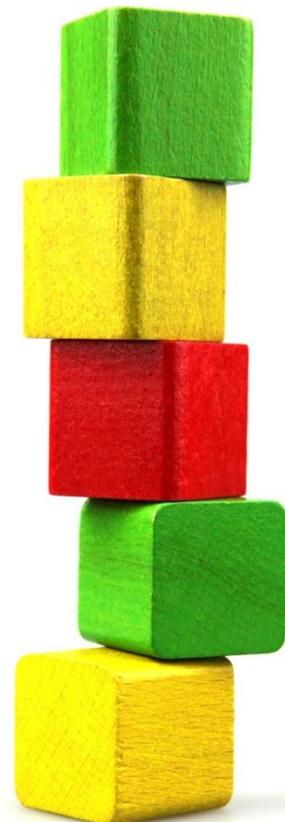




Not just a crystal ball: Enhancing your business operations through sales forecasting

Abstract

Well-constructed forecasting models have many applications in business planning. Far beyond being arithmetic tools useful only for producing numerical sales projections, forecasting models are frameworks in which market dynamics driving commercial success can be better understood, and in which the impact of market interventions can be modeled and calibrated against past performance. However, building a forecasting model to answer the right questions is a difficult balancing act requiring triangulation between the desired level of detail, the availability of reliable input data, and the tolerance of the organization to rely on well-informed judgment to make decisions. The purpose of this white paper is to describe the ways in which forecasting models can be used to support business planning, and to describe some best practices based on our experience in forecasting in the pharmaceutical industry.



Uses of Forecasting

Well-constructed forecasts have many uses in business planning. Perhaps the application which most quickly comes to mind is using the projected sales figures to inform long-range strategic investment decisions and short-range tactical operational plans, as shown in Figure 1.

However, beyond providing projections of sales figures well-constructed forecasting models can be powerful tools to enhance a company's current commercial operations (Figure 2).

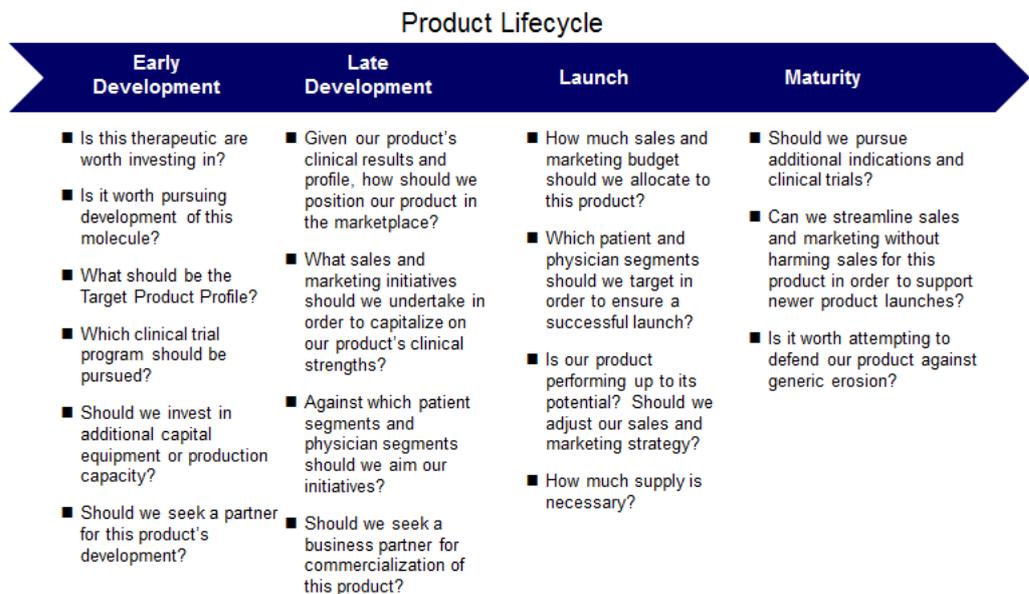


Figure 1: Forecasts can be used to inform many business decisions

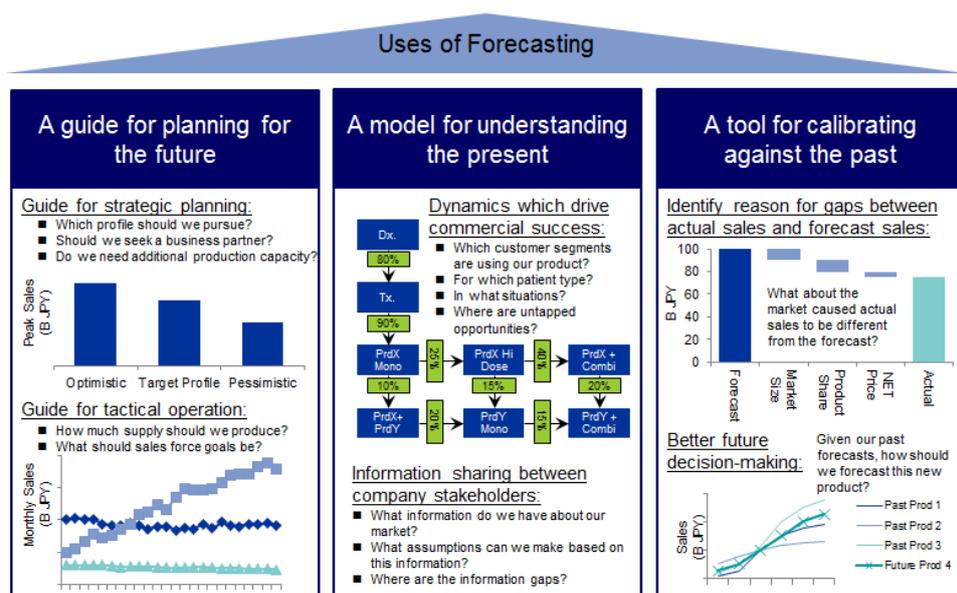


Figure 2: Forecasts can enhance business operations in many ways

Forecasting and Transparency

However, in order for a forecast to be useful for anything, it is imperative that the relationship between the forecast assumptions and the forecast results be transparent to the audience. That is, the following must be clear:

- What data was used as the basis for forecast assumptions?
- How was informed judgment used to supplement data gaps and / or generalize data implications in order to develop a complete set of forecast assumptions?
- How were the forecast assumptions combined in order to generate the numerical forecast?

We often observe in pharmaceutical companies that forecasts exist simply as sequence of yearly projected revenues, and that when the forecast is circulated to senior management or other audiences in the organization, that they are communicated without any explanation of the process by which the supporting assumptions were created.

Unfortunately, this renders the forecast useless as a tool for making any kind of business decision, thus reducing the forecast to an abstract arithmetic exercise with no relation to the business situation it was meant to model. When forecasts are presented without any supporting rationale, we commonly observe that senior management simply discards the forecast since it is not of the same numerical magnitude as their intuitive expectation (i.e. the forecast was not high enough) and that management then proceeds with planning based on numbers derived from gut-feeling but without any factual basis. In this case, the forecaster is unable to

push back on management rejection, because they have no way explaining what assumptions underlie the forecast, and how these assumptions were assembled to produce the numerical forecast results.

Balance between Technical Sophistication and Ease-of-Use

Construction of simple forecasting models in life sciences is easy compared to other industries, due to the concentration of decision making power in the hands of a relatively small number of individuals. Unlike consumer businesses in which each individual customer makes their own decision but makes up an infinitesimal portion of the overall market, decision-making authority in pharmaceuticals is held by a relatively small population of doctors. (It can be argued that in Japan, the influence of other stakeholders such as payers and pharmacists is increasing, but even taking their influence into account, the decision-making situation in pharmaceuticals is much simpler than other industries). The concentration of decision-making power in the hands of a relatively small population means that the behaviors, desires, and key decision-making factors of the relevant individuals can carefully be studied and characterized (i.e. through primary market research) and then quantitatively modeled to produce a forecast.

Especially for more common diseases (i.e. diabetes, hypertension, etc), these markets have been well-studied and the key-decision making factors in these markets are well-known and can be modeled with a high degree of detail.

In such situations, we commonly observe a tendency among forecasters to believe that a higher degree of detail will automatically lead to a more accurate or more legitimate forecast. While a sufficient level of analytical detail is necessary in order to provide an accurate model of the market situation, we frequently see that this desire for ever-higher levels of detail can lead the forecaster to waste time building complicated models and tracking down obscure data which do not necessarily lead to a more useful forecast.

When attempting to strike the right balance between technical sophistication and simplicity and ease-of-use, the key is to keep in mind the decisions which will be made based on the forecast, and to build-in a level of detail sufficient to inform those decisions.

Figures 3 and 4 show two examples of how the drug-treated patient population for a given disease in Japan could be modeled.

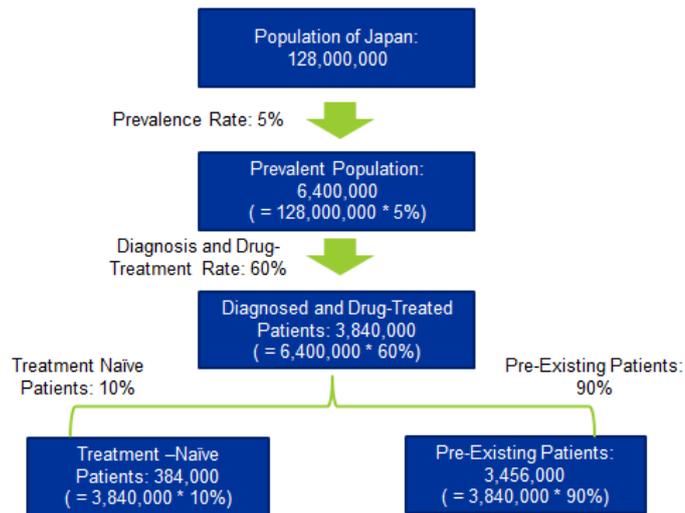


Figure 3: Estimating patient potential through top-down methodology

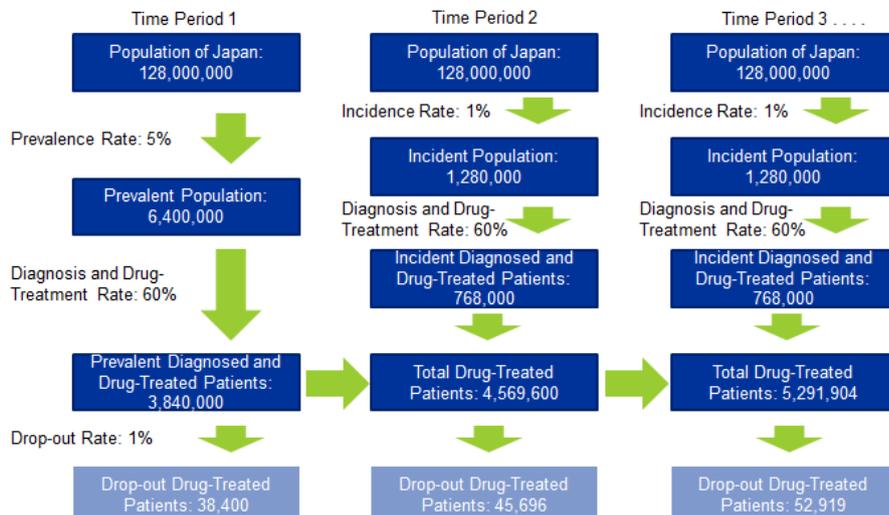


Figure 4: Estimating patient potential through patient-flow methodology

Figure 4 clearly contains much more detail than Figure 3, but this does not necessarily make Figure 4 a more legitimate or more accurate model. In this case, the model shown in Figure 4 should only be constructed if the information it contains (i.e. sensitivity between drug-treated patient population and incidence / drop-out rates) is necessary for the decisions to be supported by the forecast. For example, if the brand team is considering a campaign to reduce the drop-out rate (i.e. get patients to be more compliant on therapy and / or stay on therapy for a longer period of time), then such a level of detail would be useful because it would allow the brand team to measure the sensitivity between forecasted

revenue and drop-out rates, so they would be able to test ROI of various investment levels and then choose how much they are going to invest in the campaign and model the corresponding effect on forecasted revenues. However, if the forecast is only being used to support an early stage go/no-go investment decision following Phase 1 or 2 trials and only an overall valuation of the product is needed, then such detail is not necessary.

Some general considerations in the trade-off between technical sophistication and ease-of-use are shown in Figure 5.

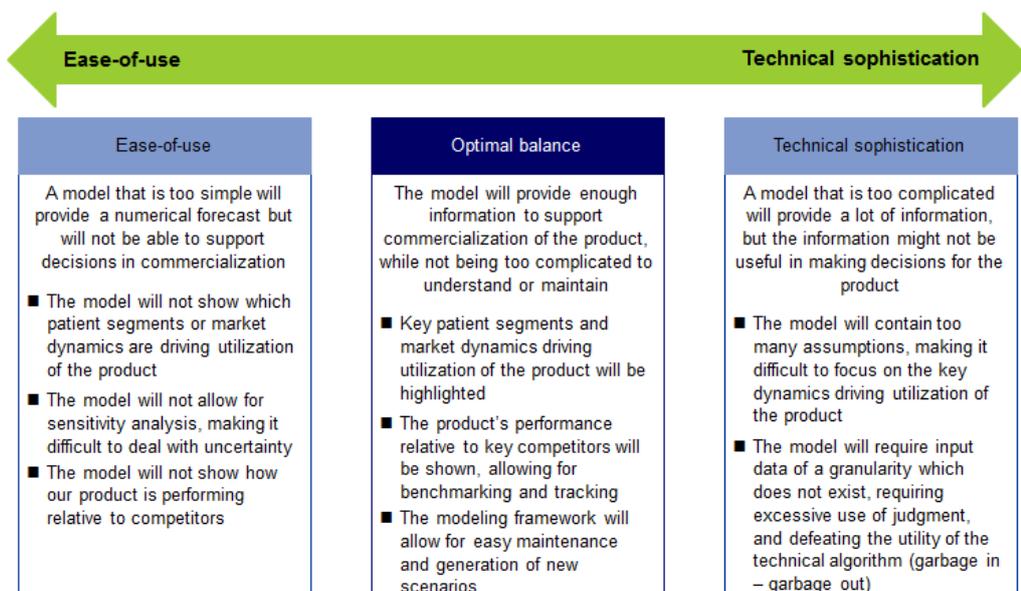


Figure 5: Trade-off between technical sophistication and ease-of-use

Forecasting Accuracy and Decision Making

We commonly observe that forecasters spend inordinate amounts of time fretting about hyper-precise, laser-beam accuracy, perhaps in response to unreasonable expectations from management.

When attempting to decide how much emphasis to put on accuracy of the forecast (i.e. the discrepancy between a forecasted value and the actual value which occurs in the market) it is again important to keep in mind the decisions which are going to be made based on the forecast. Although we will not go so far as to say that forecasting accuracy is not an important consideration, we do believe that it is important only insofar as it affects the business decisions which are made based on the forecast. If a forecast turns out to be off by 10%, but if the company would not have made a different decision had the forecast discrepancy been smaller, then the existence of the forecasting gap per se does not matter.

The degree of accuracy required to support business decisions varies with the timeframe scope of the forecast. For example, for short-range decisions such as the quarterly production plan or sales quota setting, numerical accuracy is very important. However, in these situations, especially if there is no disruptive market event in progress, it is quite easy to produce a very accurate numerical forecast. For longer-range strategic decisions, it is generally harder to produce a numerically accurate numerical forecast, but the decisions to be made based on such forecasts do not require such a high degree of numerical accuracy. For example, a go/no-go

decision could very well change if the forecast is \$250M as opposed to \$3B, but the discrepancy between forecasted sales of \$2.5B versus \$3B might not matter so much.

Conclusion

Forecasting models can be powerful tools to understand market dynamics and the trade-off between promotion and commercial success. However, their successful application requires constructing the forecast in a way to make the connection between assumptions and forecast results transparent, and to identify the right factors on which to base the forecast and to strike right balance between detail in which such factors are modeled and the need for detail in business decision making.

To implement such a process might require changing some strongly rooted institutional behaviors regarding constructing forecasts, but in our experience, a company which undertakes such an initiative will find it to be well worth the effort.

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