

DATA SCIENCE MODEL BUILDING FOR ENTERPRISE FORECASTING

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ABSTRACT

Executives today think about forecasts in almost every decision they make. Forecasting is no longer a luxury but a necessity for managers to deal with fluctuations in the economy, seasonality, changes in demand, price-cutting maneuvers by the competition, strikes, and other unexpected events. Forecasting has been proved an effective tool to help managers with problem-solving. However, forecasting is more beneficial for managers who are familiar with its basics and potential applications. They focus on forecasting sales for Corning Glass Works products as they mature through their product life cycles.

Keywords: Data Science, Finance, Enterprise forecasting, Sales, Models

INTRODUCTION

Many forecasting approaches have been developed to solve complex and managerial forecasting problems. Every approach has its particular use and is required to select according to their needs. Both the forecaster and the manager have a part to play in the selection of techniques. The better they know the possibilities for forecasting, the greater the likelihood that companies will succeed with their forecasting efforts.

The context of the forecast, availability of historical data, accuracy required, degree of accuracy, forecast time, forecast cost, benefit (or *value*), and timing of analysis are all factors that can influence the choice suggested in Huttunen et al (2019, p.16). These factors should be constantly weighed at a variety of levels. For example, the forecaster should select a technique that makes maximum use of data. Forecasters have to use one method which can deliver acceptable accuracy. However, they shouldn't try to "goldplate," another technique that may offer greater accuracy but requires more information. While this trade-off can be made easily, others, as we will see, take a lot more thought.

MAJOR FORECASTING MODELS

There are many approaches to forecast future business outcomes. However, there are only four major types of models that companies use to forecast future actions as in Huttunen et al (2019, p.16). These forecasting models will help to better understand how the companies can use these models to enhance not only business practices but also customer experience.

- Time series model
- Econometric model
- Judgmental forecasting model
- The Delphi method

TIME SERIES MODEL

This model depends upon historical data to deliver reliable forecasting. Understanding the interplay of variables in terms of time, weeks, or years will help you visualize data patterns better. There are many methods available to produce a time series model. However, these steps can be used in a spreadsheet to calculate the outcomes using recent analytical data.

- Make your time-based data (time series or values series) available for use
- The first column should comprise data that contains time and duration.
- In the next column, add any remaining forecast values.
- Select relevant data
- Click on the Data tab and select Forecast Group. After that, select the Forecast Sheet.
- Open the sheet and then select the line option or the bar graph option you wish to use.
- Enter your end date in the Forecast End box and click Create.

Once your forecasting model is set up, you can then interpret it to make your best prediction of the future.

ECONOMETRIC MODEL

Economists employ econometric modeling to predict changes and price movements. These models combine complex data, knowledge, and experience during the creation process. This type of statistical model, like its name, can be used to forecast future economic developments.

The basic structure of this model discussed in Li et al (2018, p.1220) is:

- Decide which variables you want to test. What economic relationship do you wish to test? You might ask, "Does X have any effect on Y?"
- To test this relationship, formulate a hypothesis. You can also consider other variables that could impact "Y" and label them as "Z," also known to be the control variables.
- Accumulate the data set that comprises "Y," "Z," and "X."
- This data can be plotted to identify outliers or anomalies.
- Find out if the relationship between "Y," "X," and "X" are linear, quadratic, or some other.

Use a mathematical method that you are familiar with to calculate the transformations.

JUDGMENTAL FORECASTING MODEL

Many forecasting models, including the judgmental type, use subjective and intuitive information to make their predictions. However, there are instances when no data is available. For example, situations such as launching a new product or dealing with unpredictable market conditions are situations where judgmental forecasting models can prove useful.

Some characteristics of judgmental models:

- Takes a subjective, opinionated approach
- Assumes specific variables
- Comes with limitations
- Accuracy can be improved by adding new information

This forecasting model is most useful in research and development. For example, expert panels and focus groups can offer insight that no computerized model could.

THE DELPHI MODEL

This method is used for predicting trends information from different sources. This sequence of steps was based on the Oracle of Delphi. This assumes that answers given by a group are more valuable and objective than those provided by an individual. The experts answer questions in continuous rounds and ultimately provide the company with the correct answer. As the experts review their assumptions and receive additional insights from the other panel members, the quality of the information improves.

- **Select a facilitator:** Consider the neutrality of the facilitator and their experience in researching before you choose one. This role can be of researcher or developer.
- **Choose your experts:** Businesses rely on anonymous experts to help them research products that are not yet available on the market. However, anybody with extensive experience in a particular field can be considered an expert. For example, a company might reach out to safety experts or instructors to develop a swim product. They might even reach out to professional athletes and loyal customers who use the same products.
- **Define the problem:** Companies must give details about the problem and important details to help them make an informed decision when trying to solve it. This will ensure everyone is clear about what they are being requested. A business may wish to create a monofin that has features not offered by their competitors.
- **Round one questions:** The first round of questions introduces and begins the discussion. Then, facilitators will ask experts to review the information and give anonymous feedback.
- **Round two questions:** After reviewing the answers from the panel, the facilitator edits and filters out any irrelevant data. The panel members have the opportunity to anonymously review previous responses and can submit a new response to another person's statement

- **Round three questions:** The facilitator will read through all the responses, sort through them again and send the surveys to the panel. The process can continue until there is a consensus, which could take three to four iterations.

- **Take action:** Once they have enough information, the researchers can start to make plans to implement their findings.

CONCLUSION

To correctly forecast the problem, the decision-maker should comprehend the limitations and basics associated with each technique. Forecasters can have greater confidence in their forecasts and use them more effectively. The forecaster must combine the techniques with the experience and knowledge of managers.

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