

Business forecasting

Business



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Preparation to handle business demands as they arise can give an organization the competitive edge in the industry. Accurate forecasting abilities are the key to proper preparation to handle the demand. Many systems in an organization depend on an accurate forecast like the annual budget, staffing needs, materials sourcing, and capacity planning. This paper will show how data collected from a simple daily shower will help predict the time needed for future showers and how variability can be measured and used to identify weaknesses in a process.

Business forecasting has evolved from primarily estimating using common sense and personal experience to more recently using electronic data analysis. “ Business forecasting involves a wide range of tools, including simple electronic spreadsheets; enterprise resource planning (ERP) and electronic data interchange (EDI) networks, advanced supply chain management systems, and other Web-enabled technologies. The practice attempts to pinpoint key factors in business production and extrapolate from given data sets to produce accurate projections for future costs, revenues, and opportunities.

This normally is done with an eye toward adjusting current and near-future business practices to take maximum advantage of expectations” (ecommerce, 2010). With the rapidly changing business environment that prevails currently, it is essential that data is collected and processed in a timely manner to be used in everyday business decisions or it becomes obsolete and worthless before it can even be used. Some methods used in developing forecasts are described in the textbook, Operations Management

for Competitive Advantage by Chase, Jacobs, and Aquilano are: qualitative, time series analysis, casual relationships and simulations.

Understanding forecasting and data analysis will require an understanding of some data analysis terms such as control limits and confidence intervals. Control limits, as described on the eHow website are horizontal lines on a control chart used to monitor the quality of a process. If data points fall outside these two horizontal lines, upper and lower control limits, it indicates that it is statistically likely there is a problem with the process.

The control limits are usually placed three standard deviations from the mean so there is a 99.73% probability that a data point will fall within those limits. Another tool for analyzing a process and projecting a forecast is the confidence interval. A confidence interval, according to OECD Glossary of Statistical Terms is an interval that has a known and controlled probability (generally 95% or 99%) to contain the true value.

When using process specifications of the standard three deviations, then the confidence interval is 99.73. A confidence interval for a population mean with the standard deviation known is calculated with the following formula: $\bar{X} \pm z(\sigma/\sqrt{n})$ in which n is the sample size. In general, the larger the sample size, the more confidence there is in the sample representing the population data.

With the proper use of these statistical tools a business forecaster can take a process or a set of data points representing the past sales history and calculate a reasonably accurate forecast to use for business planning. A set

of performance data collected from a daily shower routine can be used to demonstrate these statistical tools.

The mean and the standard deviation were calculated with the data taken from three weeks of daily showers. The data points collected for length of showers were: 12, 11.5, 13.5, 13, 12.5, 12.5, 12, 11.5, 13, 12.5, 13, 13, 13, 12.5, 12.5, 12.5, 13, 13, 13, 12.5, and 13.5. The sample size was 21, the standard deviation was 0.55 and the mean was 12.64. This process would therefore have an upper control limit of 14.29 and a lower control limit of 10.99.

In the text, *Operations Management for Competitive Advantage*, the authors stress that a perfect forecast is usually impossible. Many factors in the business environment cannot be predicted with certainty. Some of the external factors that affect a forecast are seasonal influences and growth trends. A seasonal factor or index is the amount of correction needed in a time series to adjust for the season of the year (Chase, 2005).

In the case of a daily shower, a seasonal factor that could influence the length of time that it takes to complete the process is the warm water travelling from the hot water heater to the shower head. As the weather warms, the water sitting in the pipes may be warmer resulting in shorter waiting times for the warm water to start running from the faucet.

Other possible seasonal effects in the case of length of a daily shower would be because of certain activities taking place during certain seasons and additional fatigue during these activities. In my case, I spend a large amount of time in the spring, summer and fall working out in the yard requiring a

longer time scrubbing out embedded dirt from these activities. The variation in the process goes up considerably during these times.

Although studying a small, personal process such as a daily shower seems insignificant it can help illustrate in simpler terms, the larger detailed process of business forecasting. Any variability removed from the system or at least understood and predicted will provide a more accurate forecast to base important decisions on.