

The use of statistics in business essay sample



All decisions of today are driven by data. This is particularly true in business where profit and optimized performance is a function of a complex array of variables, with varying degrees of correlation and definite uncertainty. Unlike the natural sciences, business environments are highly variable and uncertain; this makes statistics the only reliable tool for a business man in forecasting the trends and patterns of his trade.

While the rate at which objects fall from a given height is governed by a definite relation (The Law of Universal Gravitation), no such relation exists for the rate at which stock market indexes vary or the rate at which the sales in a given counter fluctuate with the seasons. The collection, analysis and interpretation of data are important statistical skills that are relevant to successful decision making.

The final product of these skills is an enhanced ability to:

- Solve problems in a diversity of contexts.
- Add substance to decisions. Reduce guesswork.

The increasing level of competition in business has demanded managers to incorporate quality not only into the products themselves but also into the fabrication process itself. Surprisingly it has been found that statistical methods like designed experiments and random sampling can help in the creation of processes that give a high yield with a lower level of failure. Moreover, it facilitates the development of robust products that are insensitive to changes in the environment and internal component variation.

Carefully planned statistical studies saves time and money by removing hindrances to high quality and productivity at every stage of production. For these to be effective, quality must be engineered into the products as early

as possible. In every conceivable sample that is representative of a business environment, variations are inevitable. Continuous improvement is possible only from an understanding of these fluctuations (both the nature of the deviation and the causes of the deviation).

Absolute control over random events are never feasible, therefore only a greater measurement and deeper analysis of the data can provide any useful information. It has been documented that “ Communication between a statistician and decision-maker can be difficult. One speaks in statistical jargon; the other understands the monetary or utilitarian benefit of using the statistician’s recommendations” (Ashram, 1994). Sampling in Business Sampling, which forms the backbone of inferential statistics, is widely employed in businesses.

These serve numerous applications such as the evaluation of consumer trends, employee satisfaction levels, product preferences, public concerns and so on (Stuart, 1962). To collect data from an entire population is unimaginably for more difficult than collecting data from a demographically and otherwise identical population for the following reasons:

- Cost: It is much lesser costlier to collect information from a sample than from the entire population without any significant difference in accuracy.

Accuracy: The organization and control of the data is easier with a representative sample than from a census.

- Time: The processing and collection of information is faster. This helps in making quick decisions.
- Amount of Information: More detailed information can be obtained from a sample survey than from a census, because it take less time, is less costly,

and allows us to take more care in the data processing stage. Statistical Quality Control A plant manager can use statistical quality control techniques to assure the quality of his production with a minimum of testing or inspection.

In this technique, variations in all the processes that may affect the quality of the product can be detected as well as corrected by collecting data from samples at various points during of the production sequence. This not only reduces waste but also diminishes the number of defective samples passed on to the consumer. This is much better than employing a vast amount of resources for the inspection of the products which does not in any way point to the origin of the defects themselves.

Statistical Quality Control also helps in reducing the time required for production by ensuring that each product would have to be reworked less and also by identifying bottlenecks, wait times, and other sources of delays within the process (Oakland, 2004). Six Sigma, ANOVA Gauge etc are famous Statistical Quality Control processes that have been successfully implemented in many industries around the world. Regression and Correlation studies Regression and Correlation can be performed on a set of variables to identify or prove the existence of any interdependency among them. Often, such relations are not visually evident.

A financial analyst may use regression and correlation to help understand the relationship of a financial ratio to a set of other variables in business. The relation of various types of financial assets to each other and to the other market indexes is made explicit through the uses of these techniques. Most

often, the data collected from a sample is too dispersed to make any trend visible. The identification of a line of best fit and the comparison of the data for two such samples gives its correlation coefficient, which is the most important statistical tool used in the evaluation and comparison of financial assets.

Statistics in Market Research For the success of any business strategy, constant evaluation and feedback from the customers are essential. This includes a study of the preferences of the consumers and the current buying patterns before the launch of the product; the acceptance of the product and the identification of the brand logo among various sections of the population and a forecast of the future trends. A market researcher may use test of significance to accept or reject the hypotheses about a group of buyers to which the firm wishes to sell a particular product.

Market research is generally either primary or secondary. Primary market research involves testing such as focus groups, surveys, field tests, interviews or observation, conducted or tailored specifically to that product. Secondary market research is the study of the information compiled from other sources that are related to the current source. This data however runs the risk of being biased and might not be exactly relevant to the question of concern (Kotler & Armstrong, 2007). However, a thorough understanding of the market is paramount for any business manager.

Forecasts and Sales Prediction Forecasts are an integral part of any business. The sales prediction for a particular session decides the budget allocation as well as the amount to be spent on the purchase of raw materials and other

sources. It has already been stated that Business statistics is not a science with accurate rules of formation and dissolution so that any prediction is only an intelligent guesswork. The role of statistics is to increase our confidence in this prediction by basing it on the solid ground of previous facts and time tested statistical rules.

Such predictions are very common in businesses today, ranging from the expected closing stock prices to yearly National Gross Domestic Product (GDP) estimation. Index Numbers “ The primary purpose of an index number is to provide a value useful for comparing magnitudes of aggregates of related variables to each other and to measure the changes in these magnitudes over time” (Ashram, 1994). Depending on the necessity, many index numbers have been developed.

Many of these such as the Cost of Living Index, Stock Market Index, National Unemployment indexes etc are announced on a periodic basis and they have become common terms in day to day conversation. Government agencies often report time series data in the form of index numbers. The use and interpretation of index numbers is an important tool that must be available to every manager. In determining the Cost of Living, the Bureau of Labor Statistics (BLS) first identifies a “ market basket” of goods and services that the typical consumer buys.

The Bureau surveys consumers periodically to determine the goods that they buy, the overall cost of the goods and the amount of each. The Consumer Price Index (CPI) is used to monitor changes in the cost of living over time. Increase in the CPI means an increased burden on both the average

consumer household as well as small scale business concerns (Turvey, 2004). Stock Market indexes such as the Dow Jones and NASDAQ measure the mood of the investor and their variation is a surprisingly accurate interpretation of the emotions of the market.

Similarly specific indexes give a measure of the characteristics of the unique data class that it represents. There are many other instances where statistics is used in the conduct of businesses. The modern age of computers and highly efficient computational algorithms have made the collection, evaluation and analysis of data both more significant and easier; thus enhancing this previously obscure branch into one of the most active areas in mathematics today.

Discussion Though the controlling forces in any business environment is both illogical and unpredictable there are certain patterns and trends that can be utilized for proper analysis and forecasting. Statistics has developed systems that are sufficient detailed in analysis and accurate in prediction. The complexity of the modern globalized businesses can also be embraced mathematically as they do not yield to a sudden comprehension.

It is interesting to note that most of the Nobel prizes in economics have gone to Statisticians who have had very little training in business. Game theory, The Nash equilibrium, the laws of Negotiations and so on have had tremendous applications in businesses; often revolutionizing the entire field. Similarly, further improvement in this field is a distinct possibility and many of the issues that currently plague economics and finances can be removed.

Greater awareness of these techniques among businessmen can be a good first step in this direction.