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The Importance of Statistics in Management Decision Making by CorporatewebStudios

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Todayâ€™s business environment is more competitive than it was before. It is very difficult to achieve continuous sustainable growth or hold the premier position in the competitive market. The organization that has got the privilege of first mover or early bird advantage also needs something more than a mere idea. In todayâ€™s competitive world where the customers have more choice, access to global information and very particular about their want, management of any organization needs proper tool to come up with the better result and make the customer happy. Be it new product development, targeting new customer segment or streamlining production process, todayâ€™s management face greater challenges in terms of decision making. In this scenario proper implementation of statistical tools can solve the problem. Statistics deal with available data and come up with conclusion based on those real data. Statistical techniques provide more reliable solution than the other techniques and the gut feeling. It helps managers to deal with uncertainties with more confidence. Apart from that manager can take quick short term decision as well as long term decisions with the help of statistical tools.

Focusing on Future picture

The analysis through statistical tools provides management a forecast or a picture of the future market. This is a cost effective way to take future decisions. One of the common tests in statistics is trend analysis which analyzes the past trends of the market and predicts future on the basis of that. The main aim of using statistical tool is to focus on future rather than achieve short term goal based on the gut feeling of the managers. The statistical analysis is free from biasness which provide unbiased outlook of the target market. As a result most of the decisions taken by the management with the help of statistical tools are free from weird assumptions and are objective in nature.

Backing Judgments

Statistical analysis is free from biased subjective ideas and is dependent on real findings. Sometimes leaders are not in a position to take right decisions when they are not confirmed about the real outputs from the data. But statistical analysis is purely based on data which are free from weird subjective assumptions. Statistical analysis always comes with the concrete results along with hard evidence. It provides managers a platform where decision can be more risk free and move towards a right direction. Statistic can give the conclusion of entire targeted population by taking sample data. No other tools are effective to predict about the entire targeted population with the help of small sample.

Interactions and correlations between significant variables

Correlations between the significant variables can be found out removing the spurious correlations. . With the help of careful data cleaning and after removing the outliers, statistics can identify the link and association between two variables. For an example: The relation between change in revenue and sales offers can be identified through analysis. It provides application of theories and gives the conclusion how it is connected with the other variables. As a result management will have more control on some practical issues like repeat purchase, customer satisfaction, sales volume, loyalty of consumers etc. They also have a quantitative understanding of how much to increase the independent variables to get the desired value of the dependent variable.

Ensuring Quality

When management seeks for quality assurance programs or focus on continuous improvement like Lean manufacturing or Six Sigma they select statistic as a tool. Statistics come up with the solutions which help in control process of production, minimize variations and promise to maintain consistency throughout the process. The usage of raw materials have been reduced for making or remaking of product as the analysis deals with waste or misuse. Factors like loss of materials, cost of honoring warranties because of defective shipping will be reduced. The result is cost minimization through removing error or waste. So it can be proved that statistical analysis not only helps top level management to take strategic decision about the organization, like new product launch, revenue generation, but also it helps in providing actionable decisions in ground level of production. Itâ€™s an important tool for all the hierarchy of the management.

Considerations

Though the analysis will give you almost accurate result but it is very necessary what to measure and how to design the experiment to come with exact results. It is very much needed to identify what exact question will be answered with the help of statistical analysis. Thus formulating the management question is a very important phenomenon. Every statistical tool has different aim and analyzes different factors. It is very necessary to know what analysis will be applicable in what type of data available in order to achieve the specific purpose. For example,the analysis of variance (anova) requires the dependent variable to be continuous and the independent variables to be categorical. But, the discriminant analysis requires the dependent variable to be categorical and the independent variables to be continuous. Again, the regression requires both the dependent and the independent variables to be continuous. So looking at the type of data, and keeping in mind the management objective and the problem definition, a particular test hypothesis needs to be formulated for actionable conclusions.

Statistics aiding in the focused strategy

The statistics have always been the right tool to incorporate the focused strategy for the management. For example, the management wants to enhance the brand image of a particular product. The brand image is dependent on various factors like perception, satisfaction of the product, service provided, style, association, etc. There may be a lot of factors to look at. Moreover the organization may have a huge set of samples from a survey. So the priority would be to reduce the no of factors and the huge samples to manageable ones which helps in optimization of cost as well. The factor analysis reduces the number of factors and the cluster analysis reduces the number of observations.

Then by removing the insignificant variables and combining the variables having high multicollinearity, a regression could be carried out with the brand image being the dependent variable. Thus the management has i) the significant variables to look at and ii) The choice of the combination of various independent variables for the desired level of the dependent variable. Thus it will help the management to incorporate a combination from these choices that fulfills the management objective. This helps the management to establish a focused strategy with the help of effective statistical tools and techniques.

Interpretation of the output of the analysis

The most important aspect of statistics is the interpretation of the statistical outputs and the results to the mode easily understood by the management executives. The resistance against using statistical tools has been the difficulty to understand the outputs easily. The challenge of an analyst or a management executive is to understand the interpretation and the associated assumption fully and make it easily understandable for other executives. For example the standard error of the regression of the brand image in the previous example is say 0.15. This doesnâ€™t mean that for each observation or each sample it will produce an error of 0.15 only. This merely means that if all the

samples are taken and regressed the average error of all those samples together is 0.15. Thus for a particular case the error can be more than 0.15. If this interpretation is not known it will overestimate or underestimate the risk.

Statistical Tools Used in the various management decisions

i)Logistic regression is used in the credit approval industry, admission in an academic institution or in decisions where there is a binary choice of yes or no i.e. 1 or 0 is required. The logistic regression is used to predict if a particular observation using the initial behavioral patterns would fall in the yes or no region in future.

ii) Regression Analysis is used to predict some continuous variables based on the initial independent variables like the revenue, sales, brand image, budget cost, etc.

iii) Cluster Analysis and factor analysis is used for segmentation objectives.

iv) Discriminant analysis is used for zeroing on factors helping in discrimination of the various observations into various categories. It also predicts in which category a particular observation would fall.Various other statistical models like ANOVA, ANCOVA, Time Series models like ARIMA and other multivariate analysis are used for different management objectives and problems.

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