

Statistical_Analysis_Planning_1. docx

by

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Statistical Analysis Planning

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Statistical Analysis Planning

The Mechanical Engineering field is wide and many of its applications use statistics. Statistics can help me through my current inspection engineer job by planning my activity for example coming up with a maintenance plan, collect all specific failing running hours and determine the renewal running hour. Statistical techniques are currently the most critical elements of any research. Numerous publications have shown how useful these methods are and appreciate them. For that reason, statistical techniques related and linked to my field of work and expertise include regression, sample size determination and probability models. All these three are related when it comes to the construction field.

Regression is a method in statistics used in different fields such as the construction field to try and dictate character together with strength of the connection amid a single conditional variable. Regression has two types, multiple and linear regression. Only one individualistic variable foretells the result of the dependent variable in linear regression. On the other hand, multiple linear regression makes use of more than one individualistic variable to forecast the result. Regression estimates the outcome of a few descriptive variables on the dependent variable or forecasts estimated individualistic variable for individuals whom some particulars regarding the illustrative variable are available.

Probability models are mathematical representations of an irregular phenomenon defined by a sample space, events in a sample space and chances related to every event. This model has several incidental variables and has to identify the probability distribution for all the unplanned variables. Hence, probability is critical in quantifying the chances of an event occurring. Therefore, it is possible with the data attained from probability sampling to plan for the outcome.

Sample size determination involves taking the quantity of duplicates or observations for statistical sample incorporation. Size of sample is a critical feature when it comes to any empirical study where inferences regarding a population from a sample are the target. Practically, the sample size utilized in a study is decided based on convenience, cost, or time of collecting the figures and the significance of it offering enough statistical capacity. Sample size determination reduces the amount of data collected, therefore, reducing the time and resources spent in getting the required information. All these three statistical techniques are necessary if I want to attain availability of equipment, better reliability and maintainability. As a Mechanical Engineer working with Saudi Aramco Company in Indiana, USA, it is necessary to apply these techniques together with engineering theories to optimize equipment, divisional budgets to attain greater maintainability, procedures and availability and reliability of equipment.

For instance, using the probability model can assist me in preparing for various routine maintenance. By calculating the probability of a part's wear and tear, it is possible to estimate the time it would take for the specific part of a machine to require replacement. This also applies to the budget the company needs to carry out its daily operations. There has to be a budget allocated to these types of maintenance. Sample size determination is applicable in such a way that I do not necessarily need to test every similar part or equipment necessary for the running of the company to determine their functionality. Instead of doing this for the whole company, I only take samples and use them to get the applicable final results. Lastly is the regression model. Using this model is very crucial concerning finance and time, especially when it comes to running hours. In case there is routine maintenance, regression helps indicate the outcome as a result of doing the maintenance that in this case is the failing running hours and after the maintenance is done, the renewal running hours to cater for the losses made during maintenance.

These techniques are crucial from my standpoint because they assist in different significant ways. These include maintainability, availability of equipment and reliability. All the three techniques help predict what will come to be such as the specific failing running hours and assist in determining renewal running hours. These statistical techniques practically help me plan my activities early enough. Therefore, as an inspection engineer, all these techniques are necessary if I want to make work easier and manageable.

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