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Data Analysis Techniques

13 - 17 January 2025

Geneva (Switzerland)

Data Analysis Techniques

course code: M1120 From: 13 - 17 January 2025 Venue: Geneva (Switzerland) - course Fees: 4500 Euro

Introduction

Corporate ethos which sees change as a survival necessity coupled with continual demands to achieve greater work place efficiencies and reduced operating maintenance and administration costs, means that managers, analysts and their advisors are faced with ever-increasing plant and process performance targets.

As a consequence, more and more reliance is being placed upon the accurate and reliable analysis, representation and interpretation of data.

Objectives

This Seminar aims to provide those involved in analysing or reviewing data with the understanding and practical capabilities needed to convert data into information, and then to represent this information in ways that it can be readily exploited.

- To provide delegates with a working vocabulary of analytical terms to enable them to converse with people who are experts in the areas of data analysis, statistics and probability, and to be able to read and comprehend common textbooks and journal articles in this field.
- To provide delegates with both an understanding and practical experience of a range of the more common analytical techniques and data representation methods, which have direct relevance to decision performance monitoring, decision making, and process improvement.
- To give delegates the ability to recognize which types of analysis are best suited to particular types of problems.
- To give delegates sufficient background and theoretical knowledge to be able to judge when an applied technique will likely lead to incorrect conclusions.
- To provide delegates with an overview of the main data analysis applications.

Training Methodology

The course adopts an applications-oriented approach, minimizing the time spent on the mathematics of analysis and maximizing the time spent on the use of practical methods. Delegates will explore Excel's functionality to investigate real data from a wide range of example applications.

Organisational Impact

Organizations that are exposed to best practice methodologies in the area of data analysis are consistently better able to compete on the global stage.

The participants on this course, and therefore the teams that they work within, will as a result of

their training be better positioned to influence positively the organization with innovative ideas and techniques that in turn produce a higher performing business.

Individuals exposed to this training will develop new insights into the field of data analysis, and they will learn why the best companies in the world see data analysis as one of the keys to delivering the right quality product at the lowest costs.

Personal Impact

An understanding and practical experience of a range of the more common analytical techniques and data representation methods, which have direct relevance to a wide range of issues.

The ability to recognize which types of analysis are best suited to particular types of issue.

A sufficient background and theoretical knowledge to be able to judge when an applied technique will likely lead to incorrect conclusions.

SEMINAR OUTLINE

Examples/case studies/ workshops, definitions and relevant Excel functions and Excel analysis tool pack are included throughout the course.

The Basics

The need and role of statistics in business today, types of data, the two data enemies of data analysts, data sampling, the data acquisition model.

Charting and understanding categorical data

Bar charts and their derivatives: what they are and how to use them. Pareto charts. Location charts.

Summarising data with descriptive statistics:

Mean/Average, Median, Mode, Percentiles, Deciles, and Quartiles. Measures of dispersion: The range, standard deviation and variance.

Investigating and understanding variation of a set of data:

Box & whisker plots, histograms check sheets and how to interpret them

The basis of statistical analysis: the normal distribution

The normal distribution, the origin of Six Sigma, the z-score, the standard normal distribution.

How to monitor and predict future process performance:

Variation in processes. Common and special causes of variation, tampering, statistical control, control charts: what they are and how to use them - an introduction. How to predicting future performance. Other uses of the control charts. How to predicting future performance.

Some common data distributions and their uses

Distribution for sampling: the binomial and its derivatives Distributions for safety, environment and other time based events: the Poisson distribution and its derivatives

Investigating the relationships between variables:

Scatter diagrams and their derivatives. Correlation and the correlation coefficient. Covariance. Linear regression analysis, least squares estimation and the analysis of variance. More complex regression models and transformations.

Calculating the ability of process to operate within specification:

Process capability, specification limits, calculating process capability.

Estimating values and calculating confidence intervals

Point estimates and confidence intervals for averages and standard deviations.

Hypothesis Testing for means and standard deviations

Setting up a significance test, Tests of averages (t and z tests), equivalence of two averages, comparison of an average with a pre-determined value, calculating confidence limits, tests for proportions, tests for comparing variability, the F and Chi-square distributions and tests.

Hypothesis testing for non-normal data:

Applications for the Chi-square distribution

The data analysis model:

How to get from data to conclusion