Introduction

Every professional strives to make quality decisions, and these decisions are most effective when informed by data. Statistical manipulation and quantitative analysis of data provide the foundation for meaningful insights, yet many professionals lack the skills to interpret these findings or evaluate others' interpretations critically. This gap can significantly limit decision-making effectiveness.

The **Business Decision-Making Using Data Analysis** program is designed to address this challenge, empowering professionals with the tools and skills to leverage quantitative methods for strategic decision-making. Participants will gain an appreciation for the role of data analysis in management and enhance their ability to make informed, data-driven decisions.

Course Content

Setting the Scene and Observational Decision-Making

- Introduction to quantitative methods in management.
- The role of data analysis in decision support.
- Thinking statistically: applications in business practices.
- Understanding data quality and its importance in analytics.

Using Excel to Paint a Picture of Your Data

- Profiling data using summary methods, tables, and graphs.
- Advanced use of pivot tables (one-way, two-way, multi-way).
- Exploring data through numeric descriptors (location, dispersion, distribution).
- Graphical summaries and box plots for visual insights.

Statistical (Inferential) Decision-Making – Harnessing Uncertainty

- Leveraging statistical inference to address management issues.
- Understanding and measuring uncertainty with probability distributions.
- Importance of sampling in data analysis.
- Techniques for statistical decision-making:
    - Confidence intervals and hypothesis testing.
    - Z- and T-statistics, Chi-Square analysis, Analysis of Variance (ANOVA).
- Addressing practical management concerns through statistical testing.

Predictive Decision-Making – Using Models to Build Relationships

- Understanding the value of statistical modeling in decision-making.
- Predictive modeling techniques:
    - Regression models for relationship analysis.
    - Time-series analysis for trend forecasting.

    - Autoregressive models for data-driven predictions.

Data Mining – A Brief Overview

- Overview of data mining and its applications.
- Key steps in the data mining process:
    - Data preparation, prediction, classification, and descriptive modeling.
- Common data mining techniques:
    - Cluster analysis, logistic regression, classification trees, neural networks.
- Practical applications:
    - Market basket analysis and customer relationship management (CRM).
    - Segmentation and predictive modeling strategies.

Decision Analysis for Management Judgment

- Structuring complex decision scenarios with decision models.
- Multi-criteria decision-making tools:
    - SMART (Simple Multi-Attribute Rating Technique).
    - AHP (Analytical Hierarchy Process).
- Practical examples of using decision analysis tools to evaluate strategic options.