Business Skills - Data Analysis Boot Camp

Code:	DATA-ANALY-BC
Length:	2 days
URL:	View Online

This course addresses the data analysis competencies and skills essential to both government and commercial data analysis to drive decisions. The learning objectives are met by the participants acquiring the essential knowledge of probability theory and the skills necessary to apply the techniques and formulas employed in basic statistical analysis of their data. Lectures are complimented by individual and group exercises in which the participants will gain insight into the practical application of the material. You will analyze some of your business problems, identify, and quantify the risks associated with decision making and forecasting future results. The course will be also be highly effective at providing insight into the future of analytics and the changing roles of those involved in the roles such as "business analyst", operations, and IT functions. You will understand steps needed to implement a data analysis plan for your organization and begin your plan during class.

- NOTE: Live Virtual Classroom course length is 3 days

Skills Gained

Overall goals of this program include participants acquiring the foundation of required knowledge of probability theory and gain skills in the basic business analysis, data management, and statistical analysis techniques. Participants will better be able to analyze operational data to support the information and functional needs of the organization. This overall goal is achieved by a combination of lecture, videos, outside references, discussions, and exercises. The exercises will reinforce the key concepts and also will address the practical application of these concepts and techniques in different business situations. The overall learning objectives can be broken down into the following topics:

- Be better prepared to communicate reasons to use data analysis techniques, strengths and weaknesses of each, and your recommendations based on sound data analysis principles
- Learn the scope and impact of applying qualitative and quantitative methods to the analysis of data
- Gain knowledge of the basic concepts of probability theory and statistical techniques including forecasting
- Learn and use the Data Analysis & Results set of PMPower™ Tools for Data Analysis and Business Transformation
- Support key management decisions by identifying significant trends and correlation between business results and controllable and uncontrollable variables
- Gain the knowledge of skills and knowledge to establish business process performance metrics and the mechanisms to track business process performance

Who Can Benefit

- Business Analyst, Business Systems Analyst, CBAP, CCBA
- Systems, Operations Research, Marketing, and other Analysts
- Project Manager, Program Manager, Team Leader, PMP, CAPM
- Data Modelers and Administrators, DBAs
- IT Manager, Director, VP

- Finance Manager, Director, VP
- Operations Supervisor, Manager, Director, VP
- External Consultants
- Risk Managers, Operations Risk Professionals
- Process Improvement, Audit, Internal Consultants and Staff
- Executives exploring cost reduction and process improvement options
- Executive and Administrative Assistants
- Job seekers and those who want to show dedication to process improvement
- Senior staff who make or recommend decisions to executives

Course Details

Enhance the Analysis of Business Problems and Root Causes

In addition to providing the participants the opportunity to learn and apply the needed concepts, you will apply your acquired knowledge and skills in a number of real business scenarios to learn practical applications. The measure of performance for this program consists of the following elements:

- Learn how to identify your real problems based on established qualitative and quantitative models and to enhance the accuracy in communicating real causes of performance deviations
- Identify, quantify, and reduce uncertainty in making your decisions and in forecasting future events
- Provide the foundation for the identification and documentation of information classes and impact on defining the data requirements of the business
- Prepare and present an audience-specific Analysis Report Outline and Executive Summary for adoption of Data Analysis processes

1. Course Introduction

- Logistics
- Materials
- Course Expectations
- Agile & Integrated (A&I™) set of PMPower™ Tools and Best Practices
- References & Resources
- Practice Sessions – Individuals prepare a brief list of their Challenges & Interests List. We will all introduce ourselves and the instructor will consolidate and standardize terms for our Challenges & Interests List used to further tailor the delivery. The group will debrief on areas of interest and if needed take on homework to research topics and report to class 2nd day.

2. Introduction to Data Analysis and Analytics

This purpose of this module is to review the history and evolution of the field of business intelligence and the role of data analysis. We introduce the term analytics and its relevance in gaining a competitive advantage by exploring a number of successful applications.

- Definition and history
- Current Technology Environment and the growing availability of data
- Role of the Business Analyst and Data Analyst

- Applications for gaining competitive advantages
- Fact based decision making
- Process tracking and control
- Practice Sessions – Individuals prepare a brief addition to their job description to cover their new duties using data analysis. A group exercise will review each job description portion and construct a comprehensive data analysis job description from each team.

3. Application of Probability and Probability Distributions

Effective decision-making requires a determination and assessment of the relative or expected value and uncertainty of future events. Better decisions come from knowledge of the probable impact of different controllable and uncontrollable variables. Probability theory provides the foundation for determining and taking into consideration the uncertainty and risks inherent in making decisions.

- Key concepts and essentials
- Decision making under uncertainty
- Random Variables
- Population and Samples
- Describing the properties of a distribution
- The Normal Distribution
- Many business distributions are nowhere near normal… Constraints!
- Quick description of other Distributions: Poisson, Exponential, Binomial
- Establishing Confidence Intervals
- Practice Sessions - Use spreadsheet functions to estimate parameters of a given probability distribution. From these results, establish the expected value, standard deviation. Apply these in reviewing a given business situation to address a problem and establish necessary business rules.

4. Introduction to Data Mining and Data Warehousing

- This module outlines the scope of the field of business intelligence and introduces two topics that compliment and expand the concepts of analytics to a full implementation.
- Data Mining concepts and application
- Introduction to application benefits of Data Warehousing
- Practice Sessions – Individuals discuss what data mining and data warehousing practices ongoing in their areas. Best practices and tools are noted where they are used.

5. Describing Information Needs

- This module covers the background for and best practices of information requirements of various levels of management needed to make decisions and review operational performance. Application of analytics is a key part of building systems to effectively provide the information required by all levels of management.
- Identify operational and executive information classes
- Modeling Key Decisions and the Needs for Information
- Describing Key business Transactions and Documents
- Map Information Needs to underlying Data
- Executive Information Needs and the Balanced Scorecard

- Pivot Tables in Excel
- Tracking and Managing Business Process Performance
- Selecting Measures and Targets
- Measuring Performance and finding Performance Gaps
- Root Cause Analysis
- Practice Sessions – Individuals prepare a brief presentation to justify using data analysis including at least one of the areas above. A group exercise will review each presentation and construct a consolidated presentation from each team. Best practices and tools are noted where they are used.

6. Data Exploration Concepts and Formulas

This module discusses how to apply a number of tools to extract information from a set of observations by calculating key parameters and summarizing the data in graphs and tables. The relevance and validity of the Sample information extracted from a sample is confirmed by making inferences that apply to the whole population.

- Basic Concepts
- Types of Variables
- Selecting Dependent and Independent Variables
- Sample vs. Population
- Descriptive measures of a sample
- Key Sample Parameters
- Variability
- Meanings and Measures of Shape
- Histograms
- Establishing and Analyzing Correlation among different Variables
- Curve Fitting and Explanation of Variance
- Practice Sessions – Individuals or groups use a spreadsheet to calculate a number of parameters for the provided data sets from a given or tailored business scenario.

7. Statistical Inference

- One critical step in the analysis of data is to draw conclusions about the shape and parameters of the probability distribution from the results obtained from a random sample. In this module, we address a number of tests to apply to show the validity and applicability of a set of calculated sample parameters. Additionally, we discuss the method for estimating confidence interval for the estimate of the population parameters.
- Sampling distributions
- Performing the t-test and degrees of freedom
- Establishing confidence interval for the mean and standard deviation
- Selecting sample size
- Practice Sessions - Participants discuss the needed spreadsheet techniques to perform Statistical Inference. A group exercise will validate individual work and consolidate into good explanations of the module topics.

8. Introduction to Risk Management

- This module outlines generally accepted Risk Management processes and introduces best practices that compliment and

expand traditional Risk Management. We provide a sound process for qualitative Risk Management. We discuss how and when to move from qualitative to quantitative Risk Management.

- Uncertainty & Risk Analysis
- Assessing Your Organization Risk Culture and level of Risk Tolerance
- Identifying, Describing, Ranking, Prioritizing, and Controlling Risks
- When to use Quantitative Risk Analysis
- Important Risk Management Best Practices
- Practice Sessions – Individuals outline their current and desired approach to Risk Analysis as it relates to the course material.

9. Forecasting

Decision making depends on forecasting of future events and results. Accurate forecasting depends on discovering patterns in historical data and on the assumption that those patterns will hold over time. Optimal forecast methods rely on the historical patterns and the knowledge provided by subject matter experts and even sometimes on publically available data. Different methods and techniques can be used including the need for incorporating the input from subject matter experts.

- Forecasting Methods and Models
- History of Forecasting
- Long and Short Term Forecasts
- Heuristics
- Time Series Analysis
- Establishing Trends and Business Cycles (i.e. seasonality) and Confidence Limits
- Selecting Independent Variables for Predictive Models including Regression techniques
- Practice Sessions - A number of individual practices will allow the participants to learn and apply forecasting techniques with the aid of Excel or other spreadsheet. Participants review their business scenarios with data with history of actual results, past forecasts, and the correlation of dependent variables to prepare a forecast. Participants will be asked to revise the projection based on their judgment and expertise.

10. Decision Support

- Effective support of key decisions requires the definition of the scope of a given decision or decision set. Modeling a decision requires the documentation of the measure of performance, the controllable variables and the external factors affecting the outcome. A model should not replace the acumen and judgment of the decision makers, rather augment and support decision-makers as they make rational decisions.
- Scope of the Decision and Measure of Performance
- Identification and description of needed Information Types
- Uncertainty and Risk Analysis
- What If Analysis
- Practice Sessions - Participants analyze information on the scope of a given decision and the additional facts required to document the controllable variables and the measure of performance. As part of the assignment, the participants will estimate the uncertainty and describe the risks. "Show your work." Participants present their recommendations verbally with tables and charts to illustrate key points.

11. Review

- Data Analysis and Analytics

- Probability & Distributions
- Data Mining, Data Warehousing, Need for Information
- Statistic Inference, Forecasting, & Decision Support
- Next Steps Options
- Practice Sessions – ABQ! (Adopt, Bright Spots, Quit) – Declare your intent topics from this course in your work or volunteer work in three ways: ADOPT What you will start to do; BRIGHT SPOTS What you will continue to do that has been proven to work in your organization; QUIT What you will stop doing.
- Practice Sessions – Prepare and present an audience-specific Analysis Report Outline and Executive Summary for adoption of Data Analysis processes

12. Additional Resources and Exercises

- Complex Topics for Reference
- Central Tendency and Standard Deviation
- Confidence Intervals
- Regression & Multiple Regression Analysis
- Inference & Goodness of Fit
- Curve Fitting & the Explanation of Variance
- Testing Adequacy of Model & Establishing Confidence Intervals
- Excel Tips
- Practice Sessions – Evaluations and Networking

Schedule (as of 5)

Date	Location