Harness the Power of "What If" Analytics – Shaping Your Future with Simulation

Course Outline

- 1.0 Introduction
  - Basic Concepts
    - Business Intelligence
    - Analytics
    - Real and Virtual Domains
    - Systems and Interfaces
    - General System Structure
    - Properties of Systems
    - System Example 1
    - System Example 2
    - System Example 3
    - Variables and Relationships
    - Models and Simulation
    - Data and Information
    - Defining Insight
  - Capabilities of Simulation
    - Discovery and Experimentation
    - Learning
    - Monitoring and Surveillance
    - Generating Business Insights
  - Business Intelligence Framework
    - Description
    - Overview
    - Value Generation Components
    - Monitoring and Learning Components
    - Leadership Components
    - Putting the Pieces Together
  - Simulation Framework
    - Overview
    - The Context Component - Why
    - The Approach Component - How
    - The Basic Components - What
    - The Analytical Components - What
    - The Roles Component - Who
    - The Time Component - When
    - The Organization Component - Where
    - Review

- 2.0 Principles and Practices
  - Context and Opportunities
    - Pursuing Goals

- Solving Problems
- Generating Insights
- Decision Support
- Application Areas
  - Overview
  - Business Processes
  - Industrial Processes
  - Physical Processes
  - Economics
  - Queues and Discrete Events
- System Models
  - Representing Reality
  - Model Categories
  - Defining the Structural Model
  - Defining the Functional Model
  - Defining the System Model
  - State Variables and Relationships
  - Properties of Systems
  - Components and Structure
  - Modeling Categories
- Model Components
  - Description
  - Quantitative Data
  - Qualitative Data
  - Relationships
  - Interactions
  - Engine
- System Simulation
  - Preparing to Use the Model

3.0 Modeling Techniques

- Overview
  - Approaches and Techniques
  - Classifying Models by System Properties
  - Selecting a Modeling Method
  - Approaches and Techniques Review
  - Combining Techniques
- Continuous Physical Models
  - Description and Purpose
  - Modeling Approach
  - Identifying Relationships
  - Example - Scenario
  - Example - Variables and Equations
  - Example - Simulated Results
  - Application Areas

- Business Process Models
  - Description and Purpose
  - Modeling Approach
  - Structural Model Example
  - Adding the Behavioral Model Components
  - Application Areas
- Stock and Flow Models
  - Description and Purpose
  - Modeling Approach
  - Example Scenario
  - Example Model Structure
  - Example Model Equations
  - Example Results
  - Application Areas
- Monte Carlo Models
  - Description
  - Modeling Approach
  - Defining the Structure
  - Defining the Model Behavior
  - Example Scenario
  - Example Application
  - Example Results
  - Application Areas
- Discrete Event Models
  - Purpose and Structure
  - Approach
  - The Poisson Probability Distribution
  - Example - Base Case
  - Example - Off Peak Period
  - Example - Peak Period
  - Example - Solution Options
  - Example - Solution Option 1
  - Example - Solution Option 2
  - Application Areas
- Empirical Models
  - Description and Purpose
  - Approach
  - Example Scenario
  - Data Preparation
  - Word of Caution
  - Model Generation 1
  - Model Generation 2
  - Model Evaluation
- Review Approaches and Techniques

- 4.0 Simulation
  - Opportunities and Techniques
    - Overview
    - Operational Decisions
    - Planning and Design
    - Surveillance
    - Virtual Measurements
    - Experimentation
    - Monitoring and Control
  - Data Management Considerations
    - Introduction
    - Data Categories
    - Traditional Linear Approach with Limitations
    - Managing Data Properties
    - The Simulation and Data Ecosystem
    - Modified Approach Based on Feedback
  - Simulation and the BI Program
    - Defining Scope
    - Governance and Leadership
    - Competencies and Skills Development
    - Review of the BI Framework
    - The BI System
  - Case Study
  - Introduction
  - Supply Chain Overview
  - Scope Definition
  - System Components
  - Structural Model
  - Structural Model Variables
  - Structural Model Configuration
  - Behavioral Model
  - Functional Components
  - The Dispatch Problem
  - The Operational Surveillance Problem
  - The Virtual Measurement Problem
  - The Design Problem
  - The Capacity Management Problem
  - Review

- 5.0 Summary
  - Key Concepts
  - Review