INTRODUCTION
- Predictive Analytics Definition & Core Concepts
- Terms Used in Today’s Analytics Environment
- Statistics vs. Predictive Analytics: Complimentary Technologies
- Goal-Driven Analytics
- “The Main Thing is to Keep the Main Thing the Main Thing.”
- What is the Goal of the Analysis Project?
- What are the Performance Metrics for Evaluating Success of the Decision Process?
- What is the Behavior that Impacts Performance?
- Is There Sufficient Data for the Target Behavior to Develop an Adequate Model?
- The Modeling Practice FrameworkTM
- The Analytic Project Team
- Analytic Opportunity Identification

The Advent of Data Science
- The Arena: From Business Unit-Based to IT Department-Based
- The Professionals: From Analyst to Data Scientist
- The Analyses: From Descriptive Analyses/Business Intelligence to Predictive Analyses/DataMining/Machine Learning
- What is Predictive Analytics’ Role in Big Data?
  - Market Perceptions of Big Data
  - Big Data Needs Advanced Analytics...But Does Analytics Really Need Big Data?
- What is Big Data’s Business Value?
  - Retail Use Case
  - Guerrilla Marketing Use Case
  - Medical or Government Use Case
  - ROI of Big Data and Associated Analytics
  - The Future of Big Data and Advanced Analytics

Phase 1: ASSESS
- Comprehensive Project Assessment
- Organizational Objectives
- Motivation and Alignment of Leadership
- Behavior(s) of Interest
- Environmental Constraints
- Operational Requirements
- Identification of Scarce Resources
- Threats to Project or Process
• Defining Baselines and Evaluating Project Potential

Phase 2: PLAN
• Project Definition: The Blueprints for Actionable Analytics
• The Three Steps of Model Development
  o Train
    ▪ Construct Candidate Models
    ▪ Sample Size Requirements
    ▪ Matching Modeling Methods to Project Type
  o Test
    ▪ Decision Cycle Identification
    ▪ Sample Size Requirements
    ▪ Performance Evaluation of Candidate Models
  o Validate
    ▪ Operational Decision Consistency
    ▪ Strategy Specification
    ▪ Validation Study Requirements

Phase 3: PREPARE
• Know Your Data and How it Was Generated
• Importance of Face-to-Face Interviews with those Close to Data Collection
• Difficulty of Obtaining Appropriate Data
• Data is Never Presented on a Silver Platter
• What Data Should I Include in My Analytic Sandbox?
• Some Data is Not Math-Compatible
• What Does the Outcome or Target Variable Look Like?
• What Data Representations Should I Use?
• What Data Transformations Should Apply?
• How Do I Select Variables for My Model?
  o Beware of Dependent Variables Masquerading as Input Variables
  o Example: Response to Credit Card Solicitation vs. Number of Plastics Used
• How do I construct the Train / Test / Validate data sets?
• Structuring Data for Modeling

Phase 4: MODEL
• Process Objectives and Goals
• Experimental Design: TRAIN Revisited
• Selecting Condition Attributes
  o Analytic Model Assessment
  o Statistics
  o Tables
  o Graphs
  o Resampling / Bootstrapping
    ▪ Ensemble Modeling Conceptualization
- Bias – Variance Tradeoff
- Classification Models
  - Logistic Regression
  - Decision Trees / Boosted Trees / Random Forests
  - K-Nearest Neighbor
  - Neural Networks
    - Forecasting Models
      - Linear Regression
      - Bayesian Regression
      - Neural Networks
- Multiple Models are Usually Needed
- Perfect Correlation is Not a Good Thing
- and No Correlation is a Waste of Time

Phase 5: VALIDATE
- Does Our Math Make Business Sense?
- Organizational Performance is the Only Priority
- Analytic Metrics Do Not Equal Organizational Performance Metrics
- Establish a Model Competition
- How to Pick a Challenger
- Confirming That a Valid Challenger Was Selected

Phase 6: DEPLOY
- Evaluating the Expected Performance of our Challenger
- Adoption by Domain Experts
- Adoption by the Operational Environment or End Users
- Adoption by Leadership and Stakeholders
- Project Failure is Not Our Worst Outcome...

Phase 7: MONITOR
- Adapting to a Changing Environment
- The Environment Always Changes
- Our Organizational Goals Also Change
- Measuring Primary Model Performance Degradation
- Determine When to Install A Hot-Spare Challenger Model
- Determine When to Refresh the Full 7-Phase Model Development Cycle

SPECIAL TOPICS
- The Complexity of Large-Scale Analytics
  - Start with the Low-Hanging fruit: Structured Data
  - Unstructured Data May be 90% of Overall Content, But Usually Holds Only 10% of the Value
- Specialization in Project Teams
- The Power of Adapting Core Analysis Skills
• The Even Greater Power of Honing Soft Skills
• Where to Go from Here
• Resources to Get You on Your Way

RESOURCES
• Analytic Glossary
• Recommended Books
• LinkedIn Groups
• Data Repositories
• Predictive Analytics Across Social Media
• Webinars, Courses, Conferences