# Data Analytics Boot Camp Training

Duration: **2 Day**

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This course will prepare functional managers and organizational practitioners to finally make sense of data analytics and take control of the analytic process. The “Data Analytics Boot Camp” develops core skills for goal-driven analytics and lays the foundation for data-intensive analytic projects that deliver insight, clarity, confidence and sound decision support.

Attendees will learn the four major types of problems encountered in commercial and public sector applications, and walk through a structured development process to grasp key issues they will face for each problem type. Unlike any other analytic or statistical training, this course maintains a decision strategy focus supported by work-along exercises. The exercises allow attendees to experience and organize the natural messiness of data analytics while reinforcing the skills to effectively drive their own projects. Participants return with a rich set of course notes, an analytic process guide, exercise session files and follow-on resources.

## Prerequisites

There are no prerequisites for this course.

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## Who Should Attend

This course,

- builds core capabilities for those who are new to data analytics;
- provides a more functional, streamlined and strategic mindset for those with classical statistical training; and
- serves as a structured platform for those wishing to proceed into more advanced analytics projects with greater confidence.

**The "Data Analytics Boot Camp" is suited for the following roles:**

- **Functional Managers** – who desire a practical appreciation of core analytic methods in a fast-paced, impact-focused course in order to interact more effectively with analysts and IT staff on departmental data analysis projects, regardless of their prior statistical background
- **Business Analysts** – who need to transform their quantitative capabilities into a purposeful approach to impactful prescriptive analytics by letting go of ad hoc statistical techniques and focusing specifically on a framework of core analytic strategies most appropriate for tackling common business problems
- **Experienced Statisticians** – who may be statistical wizards at the quantitative level, but realize they will be far more valuable to the organization upon learning how to adapt their classical training into a more goal-driven mindset for streamlined, agile and targeted data analytics that translate effectively into measurable impact for leadership
- **IT Specialists** – who wish to gain a better appreciation of the overall analytic process in order to more effectively prepare resources for data analysis and integrate resulting decision models within the infrastructure of today's sophisticated data storage and access environments
- **Business Intelligence Team Members** – who realize the need to take a step back and reinforce their essential core analytic capabilities in order to gain solid traction when proceeding into more advanced analytics fields such as data mining, predictive modeling, machine learning, knowledge discovery, unstructured text analysis, and data-driven decision support

## What You Will Learn

- Discover, monitor and clearly report the primary analytic contributors that affect strategic decision processes and their impact on performance metrics that are important to leadership
- Classify the four major types of analysis projects and match the best suited core analytic methods
- Experience a seven-phase Modeling Practice Framework™ for evaluating and validating organizational insights
- Structure and organize a wide range of data analysis topics from a project-oriented, decision-process perspective
- Identify critical characteristics of available data fields and leverage treatments to significantly enhance their contribution to the decision making process
- Observe a structured process to evaluate the effectiveness of individual attributes and their value to enhancing a predefined objective
- Establish a solid foundation for more advanced analytic practices such as predictive modeling and data mining

## Training Outline

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**Introduction**

- Core concepts
- Using technology effectively
- Big Data versus fat data for analytics

**The Four Basic Project Types**

- Predicting a value given specific conditions
- Identifying a category given specific conditions
- Predicting the next step in a sequence
- Identifying groups

**The Motivation for Analytic Modeling**

- Enhanced performance: An incremental strategy
- You will never have a perfect model
- Think of business as a game
- Performance metrics: Your compass to progress
- A 'Rear View Window' perspective makes it hard to drive forward
- Conditional decision-making given expected circumstances
- The critical combination: Information & Strategy

**Mathematical Modeling**

- Formulas and their parts
- Anticipating outcomes from environmental conditions
- Projecting profit
- How you think about an outcome is essential
- People are inconsistent, unreliable and messy
- There is never enough data
- Samples and populations

**Model Development in Three Steps**

- Training
- Testing
- Validation
- A Basic Guide to the Process

**Plan**

- What is the business goal of the analysis project?
- What are the performance metrics for evaluating success of the decision process?
- What is the scarce resource subject to allocation?
- What is the behavior that impacts performance?
- Is there sufficient data for the target behavior to develop an adequate model?
- What is the current baseline level of performance?
- Who is on the project team?

**Prepare**

- What data should I include in my data sandbox?
- What does a record look like?

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- What does the outcome or target variable look like?
- What data representations should I use?
- What data transformations should I use?
- How do I select variables for my model?
- How do I build my Training/Test/Validation data sets?

**Build**

- Algorithms give us formulas, not answers
- Formulas create a composite perspective
- There is no such thing as a 'good' algorithm
- Selecting the right tools for the job
- The environment is also not consistent
- Does the story make sense?
- Not all data is created equal
- Some data is not 'math compatible'
- Data Attributes
- Qualitative
- Nominal
- Ordinal
- Interval
- Multiple models are usually needed
- Adoption by domain experts, end users and leadership
- Project failure is not the worst outcome
- Some 'cool' features are just 'nice junk'
- Variability: Sometimes we want it, sometimes we don't
- Perfect correlation is not a good thing
- No correlation is a waste of time

**Confirm**

- Does our math make business sense?
- Evaluation only makes sense 'in context'
- 'Business Performance' is the only priority
- Consistent implementation strategy is critical
- Our models are in competition with each other
- How to pick a 'Challenger'
- Confirming we picked a good Challenger

**Adopt**

- Evaluating the expected performance of our Challenger
- Adoption by domain experts
- Adoption by end users
- Adoption by leadership
- Project failure is not our worst outcome

**Replace**

- Adapting to a changing environment
- The environment always changes
- Our business goals also change
- Sometimes, we just want a better answer

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- Development Process by Project Type

**Predicting a Value Given Specific Conditions**

- Relationships in Data
- Estimating the future value of an outcome based on known current conditions
- Additional precision is more difficult to obtain and may put your project at risk
- Build (observe or work-along)

**Identifying a Category Given Specific Conditions**

- Shifting our thought process when the target outcome can take on a limited set of values
- The business world is not normally distributed
- The unknown attribute we are trying to predict is critical
- The misuse of regression is dangerous to your financial health – and to your business.
- Playing the odds
- The world is round and other non-linear realities
- We need a different kind of formula… sort of
- Classification is concerned with proportions, not precision
- Build (observe or work-along)

**Predicting the Next Step in a Sequence**

- Time series problems
- Estimating the future value of an outcome by considering the direction and distance of
- change relative to our known position
- Signal versus Noise
- Plan
- Build (observe or work-along)

**Identifying Groups**

- Big Data versus Big Data Analytics – The business issues
- Putting Fat Data on a Diet
- Plan
- Build (observe or work-along)

**Wrap-up**

- The complexity of large-scale analytics
- Specialization in project teams
- The power of adapting core analysis skills
- Where to go from here
- Predictive analytics, business intelligence and other advanced technologies
- Resources to get you on your way