

Leading with Data & Analytics

The Chicago Booth Approach

This program is built on “The Chicago Booth Approach.” When thinking about data analytics, most leaders make the mistake of immediately focusing on the data. The Chicago Booth Approach teaches that the most important part of any data analytics problem is not the data, it’s about framing the right questions and developing the right theories to guide you and your teams’ data analysis.



1) BUSINESS OBJECTIVE

Define what the business is trying to achieve



2) THEORY

Describe “how the world works” as it relates to the business objective



3) MODEL

Generate a mechanism that allows you to test your theory



4) DATA

Identify the data needed (based on dictates of your model)



5) METHODS

Determine the parameters for your model by applying the appropriate method to the data (e.g. test of difference, regression)



6) IMPLEMENTATION

Translate insight into a decision that you can actually implement in your business (e.g. taking into consideration things like impact, buy-in, moving from insight to optimal policies)



7) ADAPTATION

Revisiting analytic solutions periodically to account for change

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Program Overview

As the volume of available business data expands, the winners in tomorrow's marketplace will be those who can generate insight from information. Yet, many leaders feel daunted by the sheer amount of data out there. Many others make the critical mistake of looking for patterns in the data they *have*, instead of framing productive questions to shape the data they *need*. Competency in this area is so lacking, a recent Gartner study predicted that by 2020, 80% of organizations will initiate deliberate development programs in data literacy.

Many of the ideas, methods and principles that describe the best business data and analytics practices were pioneered by faculty at the University of Chicago Booth School of Business. In this six-week program, participants learn how to “think data” the Booth way. They develop the critical and creative reasoning skills needed to frame a data analytics project, collaborate with data specialists, and ultimately make evidenced-based decisions that drive results — without sacrificing speed and agility.

APPLY THE CHICAGO BOOTH APPROACH TO WIN IN THE MARKETPLACE

Develop the key ingredients of a powerful data analytics strategy: a specific business objective, well developed theories, and a model that points the way to critical data and deep insight

FRAME QUESTIONS TO GENERATE DATA-BASED INSIGHT

Identify specific objectives and related hypotheses to drive data analysis

AVOID BIASES IN INTERPRETING DATA

Sidestep the common pitfall of unconsciously bending data to support false assumptions and preconceptions

TELL THE STORY OF THE DATA

Translate data-driven insights into actionable decisions and drive buy-in by delivering a compelling narrative



**SANJOG
MISRA**



**JEAN-PIERRE
DUBÉ**



**GÜNTER J.
HITSCH**



**DEVIN G.
POPE**

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Key Conceptual Models

- ✓ **Empirical Strategy:** A seven-step process for framing and executing data analytics projects that emphasizes the importance of generating the right questions in order to connect analytic results with critical business decisions.
- ✓ **Model Generation:** How to create an alpha-numeric equation that will allow you to use data to test a theory.
- ✓ **Behavioral Bias:** How common heuristics such as Overconfidence, Projection Bias, and “The Winner’s Curse,” can influence how data is interpreted and how your data-driven proposal will be received by those you hope to influence.
- ✓ **Telling the “Story” of the Data:** How to persuasively integrate data into your proposal without becoming bogged down in minutiae that will be lost on most audiences.
- ✓ **The Future of Data Analytics:** An overview of the evolution of fields like AI, machine learning, and deep learning, and ways they can be leveraged to address business problems today.

Additional Program Features

- ✓ **Practitioner Focus:** In a series of exclusive video interviews, Morgan Hughes (Head of Finance at Airbnb; former VP of Finance at GrubHub):
 - Shares her experiences leveraging business analytics to drive growth and tackle business challenges.
 - Provides practical advice and real-world examples that illustrate how the Empirical Strategy can be used to generate impactful decisions in the face of complex problems.
- ✓ **Key Skills Guides:** Detailed “how-to” guidance on fundamental quantitative skills such as writing equations, dealing with data gaps, and selecting appropriate data methods.
- ✓ **Sample Assignment Deliverables:** Model fictional deliverables that serve as illustrative examples of high-quality finished assignment submissions.

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Curriculum: Week by Week

MODULE

One: Define Your Business Objective

Video Lectures: 50 Minutes
Assignments: 30 Minutes

Two: Articulate Your Theory

Video Lectures: 80 Minutes
Assignments: 90 Minutes
Live Virtual Events: 90 Minutes

Three: Construct Your Model

Video Lectures: 60 Minutes
Assignments: 90 Minutes

Four: Identify Data and Methods

Video Lectures: 70 Minutes
Assignments: 90 Minutes
Live Virtual Events: 90 Minutes

Five: Generate Insight

Video Lectures: 80 Minutes
Assignments: 120 Minutes

Six: Tell the Story of the Data

Video Lectures: 50 Minutes
Assignments: 90 Minutes
Live Virtual Events: 90 Minutes

LECTURES [VIDEOS]

- The Chicago Booth Approach
- From Theory to Model
- From Model to Data
- From Data to Methods
- From Insights to Action

- Pricing in Practice
- Pricing at ZipRecruiter
- The Theory: Value and Willingness-to-Pay
- From Theory to Model: The Role of Demand

- Incentivizing a Salesforce
- The Model: The Virtual Salesperson
- Estimation: Solving for Effort
- Implementation and Adaptation

- What Is Prediction?
- The Predictive Modeling Process
- Personalized Targeting
- Predicting Incremental Value

- Loss vs. Gain Framing
- Overconfidence
- Projection Bias
- The Winner's Curse

- The Four V's of Big Data
- The AI Promise
- Machine Learning and Deep Learning
- Telling the Story of the Data

KEY LEARNING

Professor Sanjog Misra walks participants through the steps in the Empirical Strategy framework, a structured approach to planning and executing data analytics efforts. Participants will use this approach throughout the program to address a critical issue facing their business.

Professor Jean-Pierre Dubé describes how ZipRecruiter used data analytics to address one of the most critical questions any business can face: How much to charge for its products or services. Careful attention is paid to how ZipRecruiter developed a theory of customer behavior, breaking down the links in that decision-chain and teasing out the contributing factors. Participants will demonstrate that same type of rigor as they develop their own theory related to a critical business objective.

Then, Professor Misra explains how to generate a data model by walking participants through a case study from the burgeoning field of people analytics. Here he focuses on translating theories into the quantitative models needed to test those theories. Along the way, he addresses key struggle points, such as how to account for "unobservable" factors, like human effort, by leveraging the data you have on hand.

In this module, Professor Günter Hitsch explains some of the data methods and tools needed to understand relationships in the data you have, or collect the data you need. Particular attention is paid to the field of customer targeting. While market segmentation and targeting are certainly not new practices, Professor Hitsch demonstrates how data analytics enables much greater precision and reliability than traditional methods.

How can human bias play a role in data analytics? It's all numbers and equations, right? In fact, bias can creep into data analytics in a number of ways, influencing your process, impacting how you interpret results, even affecting how your decision is received by those you hope to influence. In this module, Professor Devin Pope walks through some of the common human biases that can influence a data analytics project and provides helpful tips for mitigating, avoiding (and even leveraging) that influence.

In the final module, Professor Misra explains how to persuasively convey data-based insights to a broad audience. He also provides a guided tour of the future of data analytics, tracing how fields like AI, machine learning, and deep learning have evolved and the ways they are being leveraged to address business problems. This provides participants with a practical vocabulary they can use to explore these approaches with data professionals when addressing future challenges.

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Assignments

MODULE	ASSIGNMENT
Orientation	Pre-Work: Identify Your Business Challenge Participants identify a pressing issue or opportunity facing their business as a starting point for their inquiry.
Module One	Define Your Business Objective Participants narrow their focus to determine what they will achieve for the business in addressing this issue, and a critical question they will need to answer in order to do so (their "Objective").
Module Two	Articulate Your Theory Participants construct a framework that describes how the world works in relation to their objective, considering contributing factors to that objective and relationships between them.
Module Three	Construct Your Model Participants translate their theory into a simple equation of variables and parameters representing data inputs and the relationship between those inputs.
Module Four	Identify Data and Methods Participants determine the data and related methods needed to parameterize their model. As needed, they brainstorm opportunities to substitute for or collect missing data.
Module Five	Generate Insight Based on participants' level of technical ability and/or access to technical support, participants, may move forward with applying data methods and generating results; alternately, they may create a plan to engage data analysts to run the data collection and analysis post-program. They also "stress test" their own process to guard against bias and to mitigate its presence as they move to socialize their results.
Module Six	Tell the Story of the Data Participants assemble a final presentation that characterizes: a) the opportunity facing the business, the insights gleaned from their analysis, and a related proposal, or b) theories under consideration, how their planned analysis will shed light on those theories, and implications for future action. Participants also articulate considerations and next steps for validating their analysis and translating insights into a firm business decision.

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Faculty Bios



SANJOG MISRA

Charles H. Kellstadt Professor of Marketing and Neubauer Family Faculty Fellow

Sanjog Misra is the Charles H. Kellstadt Professor of Marketing at the University of Chicago Booth School of Business. His research focuses on the use of structural econometric methods to study consumer and firm decisions. Professor Misra currently serves as Co-Editor of Quantitative Marketing and Economics. He has worked with companies such as Xerox, Verizon, Eli Lilly, Adventis, Mercer Consulting, and Sprint.



JEAN-PIERRE DUBÉ

Sigmund E. Edelstone Professor of Marketing

Jean-Pierre Dubé is the Sigmund E. Edelstone Professor of Marketing at the University of Chicago Booth School of Business. Professor Dubé is also director of the Kilts Center for Marketing at the Booth School and a Research Associate at the National Bureau of Economic Research. From 2008–2010, he was a research consultant for the Yahoo! Microeconomics Research group.



GÜNTER J. HITSCH

Professor of Marketing and John E. Jeuck Faculty Fellow

Günter J. Hitsch studies quantitative marketing and industrial organization. He is the recipient of two Kilts Center Fellowships, a True North Communications Inc. Scholarship, and a Fellowship from the Ministry of Science in Austria. Hitsch is a member of the American Economic Association, American Marketing Association, the Econometric Society, and INFORMS.



DEVIN G. POPE

Professor of Behavioral Science

Devin Pope studies a variety of topics at the intersection of economics and psychology. Using primarily observational data, Pope studies how psychological biases play out in field settings and economic markets. He has published work in top economics outlets such as the American Economic Review, Quarterly Journal of Economics, Journal of Political Economy, and Review of Economic Studies.

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Featured Practitioner



MORGAN HUGHES

Head of Finance, Experiences at Airbnb

Morgan Hughes has worked in finance, analytics, strategy and consulting for over 15 years. She currently serves as Head of Finance at Airbnb for Experiences, a fast-growing and innovative division at this tech unicorn in Silicon Valley.

Prior to Airbnb, Morgan was VP Finance & Analytics at Grubhub for nearly a decade where she built this function from the ground up and drove analytics company-wide. She grew a team of 30+ financial analysts, BI specialists and data scientists, and she partnered with business leaders to better understand KPI performance and support decision-making for the company. She led the development of Grubhub's first Pricing platform and its first A/B testing platform - running thousands of iterative experiments a year. During her tenure, Morgan helped grow Grubhub's annual revenues 70X+.

Morgan received her MBA from the University of Chicago Booth School of Business and her BA from the University of Pennsylvania. She resides in San Francisco and is the Vice Chair of SkyART, a non-profit that offers free art programs for youth residing in inner city neighborhoods.

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Project Examples

NAME	DESCRIPTION	PROJECTED BUSINESS IMPACT	PROJECTED FINANCIAL IMPACT
Developing Data Driven Price Modelling to Improve Business Profitability	An SVP of Product Management at an Industrial company leveraged regression analysis to improve prices of existing products by applying weights to factors impacting prices such as micro level, fraction, pack size, transportation and payment terms and treatment.	Improve Profitability	\$6,250,000
Discounting and Promotions Effectiveness	A Sr. Manager of Analytics at a Food & Beverages company wanted to explore how efficiently their organization's discounting programs influenced cost-to-serve outcomes and designed an analysis to measure the "incentivized cost-to-serve" of various combinations of programs, products, and customers.	Increased Efficiency	\$625,000
ROI of Direct Mail Marketing	A Manager of Client Solutions at a Manufacturing company analyzed the financial value of direct mail efforts used to promote seminars to determine whether it is more or less impactful and cost-effective than email campaigns.	Increased Efficiency	\$325,000
Improving Website Retention	A VP of Marketing at a Technology company analyzed website retention with the goal of improving the experience for current users and driving new users to the site. This allowed the organization to understand what users find most valuable in order to better focus future development efforts.	Increased Customer Loyalty	Currently Measuring