

# **Class 1: Customer Analytics Overview**

**Professor Florian Zettelmeyer**  
Kellogg School of Management


**Customer Analytics**

**The information revolution has given firms the possibility to know much more about their customers than before**

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## **WHAT INFORMATION TRAIL DO WE LEAVE?**

- credit card transactions
- travel
- catalog/online purchases
- web surfing
- audio/video streaming
- DVR watching habits
- reactions to mail/e-mail offers
- customer support calls
- self-provided information on preferences, income, demographics
- location information
- usage information (machine sensors)
- social network posts and links



**What does all this reveal about us and how might it be used –  
for our and/or a firm's advantage?**

## The business view of customer information ...

Access to the information captured and made manageable by modern databases is becoming the business equivalent of the scientific breakthroughs of the last century when the fundamental building blocks of matter were cracked open and understood.

- Marketing Week, (9/3/98)

## The popular press view of customer information ...



## Customer information can be extremely useful for both the firm AND the consumer

### USES OF CUSTOMER INFORMATION

- **Grade customers**
  - Calculate customer worth to the organization
- **Increase customer loyalty**
  - Delight customers with relevant knowledge
- **Intervene to prevent customer attrition**
  - Develop models which predict "early signs" of customer dissatisfaction
- **Target marketing to customer interest**



BNY MELLON

Neiman Marcus

amazon.com

NORDSTROM

verizon



Cleversafe

## **Problem:**

### **It is very difficult to act intelligently on such information**

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#### **DIFFICULTIES IN MARKETING WITH CUSTOMER ANALYTICS**

- Organizations are used to thinking about products, not customers
- Customer data is hard to gather
- Databases are very hard to combine
- Determining the worth of a customer can be difficult
- Marketers are not used to making decisions with data acquisition in mind
- Good customer analytics requires sophisticated modeling
- Marketers are bad at analytics, statisticians are bad at marketing...



**In this course you learn to overcome these problems**

## **Step 1: To introduce the customer as the unit of analysis**

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#### **COURSE OBJECTIVES IN STEP 1**

- To understand the premise behind customer-centric marketing
- To understand the customer lifecycle
- To understand the concept of customer profitability
- To understand the basics of lifetime value calculations
- To explore how lifetime value can be used to guide marketing decisions

## Step 2: To introduce the key strategic initiatives using customer information

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### COURSE OBJECTIVES IN STEP 2

- To understand how to acquire customers
- To understand how to do customer development
  - To understand how to cross-sell
  - To understand how to up-sell
- To understand how to manage customer churn (attrition)

## Step 3: To introduce analytical and statistical modeling of customer information

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### COURSE OBJECTIVES IN STEP 3

- To distinguish good from bad analytics
- To understand different types of predictive models (Heuristics, Statistical Models, Machine Learning)
- RFM Analysis (Heuristics)
- Logistic Regression (Statistical Model)
- Neural Nets & Decision Trees (Machine Learning Models)
- Market Based Analysis/Recommendation Systems (Algorithmic Models)
- To understand how to choose among offers with experiments



## Step 4: To understand when analytical methods are appropriate and when they fail

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### COURSE OBJECTIVES IN STEP 4

- To understand why customer analytics has sometimes failed in the past
- To learn how to avoid common mistakes in implementing customer analytics
- To understand how marketing objectives interact with how customer data should be used



What you will have learned in these four steps enables you to implement  
"Customer Analytics" in practice

## What is new about Big Data?

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### ***"Big" Data***

**There is lots of it**

#### **"Volume, Variety, Velocity"**

- Move from transactions to clicks, physical movements, and networks
- Mash-ups of seemingly unrelated databases
- Tracking of pre-purchase behavior
- Tracking of post-purchase usage behavior

#### **Computing**

- From mainframes to shared-nothing clusters
- New tools (Hadoop, Pig, Mahout, Revolution R, ...)
- From on-site to the cloud
  - Amazon Web Services
  - IBM BigInsights
  - Oracle Cloud Services
  - Microsoft Azure ...

What is new about Big Data?

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## ***Big "Data"***

Data enables customer analytics



What is new about Big Data?

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## ***Big "Data"***

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## What is new about Big Data?

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# *Big "Data"*

### Data enables customer analytics

#### **NOT NEW: Basic marketing questions**

- Still interested in making predictions (e.g. who do we target?)
- Still interested in finding patterns (e.g. what drives customer churn?)
- Still interested in evaluating marketing programs (e.g. e-mail promotion)

#### **NOT NEW: Analytical approaches**

- Regression-based approaches (e.g. Logistic regression)
- Tree-based approaches (e.g. Random Forests)
- Social approaches (e.g. Collaborative Filtering)
- Experimental approaches (e.g. A/B tests)

## "Big" is only a small part of big data

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# *Big Data*

### Is about a customer analytics mindset

- Challenge conventional wisdom
- Try new ideas: R&D
- Design all processes with measurement in mind
- Test everything



**This course develops a customer analytics mindset and teaches the tools to make it work in practice**

## Course Structure

### Customer Centric Marketing

- Customer Analytics Overview; Quantifying Customer Value (Class 1)
- Case Analysis: "Home Alarm, Inc.: Assessing Customer Lifetime Value" and Testing (Class 3)

### Getting Ready for Analytics

- How to Tell Good From Bad Data Analytics (Class 2)
- Using Stata for Basic Customer Analysis (Class 4)
- Statistics Review (Class 6)

### Prospecting and Targeting the Right Customers

- Predicting Response with RFM analysis (Class 5)
- Case Analysis: "Tuango: RFM Analysis for Mobile App Push Messaging"; Lift and Gains (Class 7)
- Predicting Response with Logistic Regression (Class 8)
- Case Analysis: "BookBinders: Predicting Response with Logistic Regression" (Class 10)
- Predicting Response with Neural Networks (Class 9)
- Predicting Response with Decision Trees (Class 11)

### Developing Customers

- Case Analysis: "Intuit: Quickbooks Upgrade" (Class 12)
- Next-Product-To-Buy Models: Learning From Purchases (Class 13)
- Recommendation Systems: Learning From Ratings (Class 14)

### Retaining Customers

- Predicting Attrition (Class 15)
- Case Analysis: "Cell2Cell: the Churn Game" (Class 17)

### Selecting the Right Offers

- Design of Experiments / Multi Variable Testing (Class 16)
- Case Analysis: "Capital One: Information-Based Credit Card Design" (Class 19)

### Limitations of Customer Analytics

- When Customer Analytics, CRM, and Databases Fail (Class 18)

### Wrap-up

- Wrap-Up (Class 20)

## Course Schedule and Assignment Due Dates

Date	Class #	Class Title	Assignments Due
September 27	1	Customer Analytics Overview; Quantifying Customer Value	
September 27	2	How to Tell Good From Bad Data Analytics	
October 4	3	Case Analysis: "Home Alarm, Inc.: Assessing Customer Lifetime Value"; Testing	Home Alarm LCV
October 4	4	Using Stata for Basic Customer Analysis	
October 11	5	Predicting Response with RFM Analysis	Pentathlon Part II
October 11	6	Statistics Review	
October 18	7	Case Analysis: "Tuango: RFM Analysis for Mobile App Push Messaging"; Lift and Gains	Tuango RFM
October 18	8	Predicting Response with Logistic Regression	
October 25	9	Predicting Response with Neural Networks	
October 25	10	Case Analysis: "BookBinders: Predicting Response with Logistic Regression"	BB Logistic
November 1	11	Predicting Response with Decision Trees	
November 1	12	Case Analysis: "Intuit: Quickbooks Upgrade"	Intuit Quickbooks
November 8	13	"Next-Product-To-Buy Models: Learning From Purchases	
November 8	14	Recommendation Systems: Learning From Ratings	
November 15	15	Predicting Attrition	Pentathlon Part III
November 15	16	Design of Experiments / Multi Variable Testing	
November 22	17	Case Analysis: "Cell2Cell: The Churn Game"	Cell2Cell Churn
November 22	18	When Customer Analytics, CRM, and Databases Fail	
December 6	19	Case Analysis: "Capital One: Information-Based Credit Card Design"	Capital One Testing
December 6	20	Wrap-Up	



# Syllabus

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## Lab Session Dates

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I will be holding **Lab Sessions** online **every week**.

During these sessions I am available to answer any questions you have about past lectures, upcoming or past cases, or how to work with Stata. Unless otherwise announced, I do not cover new material during lab sessions. These sessions are fully optional, however, I recommend you come with questions if you feel falling behind on any of the material.

# Readings consist of a mixture of cases and articles -- no book is required

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## REQUIRED COURSE MATERIALS

- Course reader (study.net)
- Course Management System (Canvas):
  - Syllabus
  - Additional readings
  - Assignments
  - Datasets for assignments
  - Program files and documentation
  - Lecture notes (on day of class)
  - Assignment submission

## OPTIONAL COURSE MATERIALS

- "A Gentle Introduction to Stata" by Alan C. Acock
- "Data Analysis Using Stata" by Ulrich Kohler and Frauke Kreuter

# Why do we use Stata...

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## as opposed to EXCEL?

- Excel lacks statistical tools needed for serious analysis:
  - e.g. identify among millions of customers those who are the most profitable to target with a particular marketing campaign or with a particular offer
- Excel cannot handle the 50,000-100,000 customer records we routinely use
- Stata is much easier to use for any data work that goes beyond the basics

## as opposed to SPSS or SAS?

- Over the last 5 years, much more information available to managers than before.
- Problem: vast majority of managers have very poor analytical skills.
  - > Many small firms simply don't emphasize data is decision making, and many large firms have dedicated analytics departments
  - > Analytics departments staffed with professional statisticians and mathematicians who don't mind learning SPSS or SAS because that is their main job.
- My goal: help "democratize" information-based decision making.
- Stata is the perfect tool for democratization:
  - is easy to use (PC based, not designed for mainframe)
  - is extremely powerful (does everything SPSS and SAS does)
  - can take with you after you graduate and use **independent** of whatever **infrastructure** exists at the firm you will work for

## as opposed to R?

- Much easier and polished, similarly powerful.

## “Stata” is free for students

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### SOFTWARE AND DOCUMENTATION

- Stata/IC 13 software and Getting Started manual normally costs \$1,495
- Free for Kellogg Students
- Need to have it installed on laptop during week 2
- <https://kis.kellogg.northwestern.edu/Pages/StataStatisticalPackage.aspx>

## Question: “Do I have to know a lot of statistics to succeed?”

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### Answer:

**No .** While we will use statistics to analyze customer information and many of the assignments require you to use statistical techniques, all you need will be introduced in class with enough opportunity to get familiar with it.

## Nonetheless, this course is not for the faint-hearted!

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### COURSE CHARACTERISTICS

- Lots of marketing content
- Lots of data analysis
  - > Don't take the course if you are afraid of getting your hands dirty
- Lots of cases (and preparation)
- Lots of discussion / interaction  
(readings and participation are important)



**Immediate applicability of course material**

## Evaluations rely on a variety of different assignments

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### GRADING POLICY

- Individual case exercises (4) -- 42% (due by 8:30 a.m.)
- Group case exercises (4) -- 48% (due by 8:30 a.m.)
- Class participation -- 10%

### GROUP FORMATION

- 4 (3-5) students per group
- Self-assigned but all in the same section
- Use Canvas to form teams **by Class 8**

## This class has the following policies

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### ELECTRONIC DEVICE POLICY

- Laptops are not permitted...
  - except when we are discussing a quantitative case or using Stata in class
- Phones have to be off
  - No texting in class
  - No e-mail
  - No web surfing

### SEATING POLICY

- Use seating chart
- Please stay in the seat you pick after the break (**today**)
  - > trade if you have strong preferences about seating

### CLASSROOM EXPECTATIONS

- We will start **on time** – more than one absence (or late arrivals) will affect your grade
- Please bring **nameplate** to class
- Abide by the Kellogg Student Code of Classroom Etiquette

## About me...

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### BACKGROUND

- At Kellogg since 2008
  - Nancy L. Ertle Professor of Marketing
  - Director, Program on Data Analytics at Kellogg
- Associate Professor of Marketing,  
Chair Marketing Group at Haas/Berkeley since 1998
- Ph.D. from MIT (Management Science, Marketing)
- M.Sc. in Economics
- Worked at McKinsey & Company's German and Brazilian offices
- Board of Advisors: Bayalarm
- Consulting, Exec Ed for BMW, J&J, Haas, Security Network of America, GE
- Legal Expert for AOL, Microsoft, Toyota

## Think of taking this course as entering into a contract

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### I PROMISE

- Deliver what I presented today: I will teach you the "science" part of Marketing
- You will be in a position to intelligently manage and benefit from marketing analytics people (without turning you into a statistician)
- Give you a way of thinking about Customer Analytics that will be relevant when you need it, not just today
- Accessible when you need help

### YOU PROMISE

- Very well prepared (readings, assignments, cases)
- Regular attendance
- On time

**Questions?**