

Fall 9-1-2017

## BMKT 491.01: ST - Telling the Story with Data

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# Telling the Story with Data

Fall 2017, 3 credits

T-Th, 11:00-12:20, GBB L09

CRN 74053 (G)/72582 (UG)

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Office Hours: Tuesday 12:30-2:00 or by appointment. (GBB 336)

## Course Description

This course explores how we turn data into stories that can be understood by a nontechnical audience. We will work with both raw and summarized data from several industries. In this course, we will not write code, but we will work primarily with Excel (although students are free to use other tools they know). This course takes us through the lifecycle of data science questions and communication. Starting from business goals or objectives, we will develop the framework to turn those goals into specific questions that can be answered with data. We will then assemble the data sets, sometimes in conjunction with the more technical class Applied Data Analysis. All students will work extensively in Excel, honing their skills in this critical business application.

After working through the process of putting together the data, we will focus on how to tell the story in the data. Stories can be told via emails, documents, presentations, animations, and visualizations and we will gain experience and feedback in all these media. Wherever possible we will present results to people in the private sector to get their feedback and gain real-world experience.

Note: this syllabus is subject to modification as the course progresses. Please check Moodle for the most up-to-date version if you have questions or feel like we've departed from the script laid out in the version you have.

## Course Objectives

1. Students will learn how to refine business questions so they can be answered with data.
2. Students will practice assembling data sets. This will include data mockups, assessing the limitations of a data set, iterating on a data set to improve it.
3. Students will practice and refine their ability to leverage data to answer questions.
4. Students will learn how to craft an answer to a data-based question that is appropriate to the question, the audience, and the medium.
5. Students will practice working with cross-functional teams across courses.
6. Students will refine their ability to communicate technical results to a non-technical audience.

7. Students will learn real-world applications of data to business problems and deliver results to stakeholders.

## Required Materials

1. *Everybody Lies*, Seth Stephens-Davidowitz, Harper Collins, 2017.
2. *The Best American Infographics 2016*, Gareth Cook (Editor), Houghton Mifflin Harcourt, 2017.

## Assessment

Students will be evaluated on regular analysis assignments that will roughly follow a two-week cycle as we work with six external data sets throughout the course.

### Class Participation: 20%

Students are expected to attend class and participate in class discussions. Missing more than 15% of classes without an excuse will result in losing half the class participation credit. Completing the reading in time for the discussion is a critical component of getting a good class participation score.

### Email Assignment: 8%

Over the course of the semester, I want you to send me ten emails to [bmkt491.2@gmail.com](mailto:bmkt491.2@gmail.com). This email can be short and should include a link to a data or data science article, story, video, etc. Ideally this email will be sent to a friend, family member, colleague or acquaintance with the class-specific email blind carbon copied. This assignment builds a useful networking muscle. Emails sent with zero or one typographical error will receive a 10/10. Each typographical error beyond the first will drop the points by 3.

### Analysis Assignments: 72%

There will be six assignments throughout the course based on the data we have worked with in class. Due dates will be determined based on the scope of work. Each assignment is worth 12% of your grade. Assignments will be given to you in the form of an analysis brief. This document contains an introduction to the problem, a description of the data that is available, the specific questions that are being asked, and the requirements for deliver. *Please read the analysis brief carefully for each assignment.*

### Graduate Project

Students who are taking the class for graduate credit will have to complete an additional project. This project will be worth 20% of your grade (discounting the above by 0.8). We'll work to define a project that is intrinsically interesting to you and you'll present the results to the class during the last week.

### Class Format

The class will incorporate a mixture of lecture, guest lecture, hands on work, and discussion. Early in the semester we will improve our skills with Excel and learn the rudiments of data-driven communication. Throughout the course we will practice these skills in assignments and exercises. Wherever possible,

business owners will join class to discuss the questions they have and the data that can be used to answer these questions.

As always pay attention in class and to Moodle for specific assignments and expectations, though this should give you a sense of when you will be particularly busy.

*Note: Class on Tuesday, November 21st (the week of Thanksgiving) will be online only.*

## Data Projects

Our data sets will be determined as the course progresses, but here are some examples from past years that we might revisit.

1. ALPS: ALPS is a Missoula company with a national footprint. They insure attorneys in 40 states. We will work with them to understand challenges in the insurance space and how data can be leveraged to better understand their customer base.
2. Missoula Co-op: We will partner with the local Missoula co-op to help them build reports around product and department use.
3. Wedge Co-op: The Wedge is the largest co-operative grocery store in the country and we are fortunate to have an enduring partnership with them. They have extremely rich data on consumer purchasing tied to co-op owner numbers. As such, we will work with several different views of their data.
  - a. Understanding how customers respond to changing prices at the Juice Bar.
  - b. Understanding the impact of store construction and a one-day closure during 2016.
  - c. Customer segmentation and product affinities.
4. Noon's: Noon's runs a gas distribution business as well as three convenience stores around Missoula. We will analyze the transaction data from their stores and produce dashboard mockups to display store and product performance.
5. Dram Shop: We will partner with the excellent and delicious Dram Shop in Missoula to help them be more successful. I wouldn't be surprised if we had an end-of-semester gathering there.
6. Seattle Bike Share data: We will work with data on the Seattle bike share program to understand patterns in consumer usage.
7. Craigslist Auto Data: This data set will be generated by the class. We will use CL data to gather information on used car sales across several makes/models and in different parts of the country. Then we will analyze that data using regression models to figure out what cars are good or bad deals.

## The "fine print"

*Professional Business Conduct in Class:* You are preparing to enter the business world as professionals and to prepare for a business career, so I expect each of you to behave in a professional manner in class.

- Arrive on time and stay for the entire class (unless excused by me).
- Behave with honesty and integrity. Don't let your team down!
- Respect everyone in class and listen openly to their ideas.

- Come to class prepared for discussion.
- Refrain from engaging in behavior that disrupts the class- this means no cell phones!

If at any time you are displaying disrespectful behavior, you may be asked to leave.

*Academic Integrity:* Academic misconduct is any activity that may compromise the academic integrity of the University of Montana. Academic misconduct includes, but is not limited to, deceptive acts such as cheating and plagiarism. Please note that it is a form of academic misconduct to submit work that was previously used in another course.

“Plagiarism is the representing of another’s work as one’s own. It is a particularly intolerable offense in the academic community and is strictly forbidden. Students who plagiarize may fail the course and be remanded to the Academic Court for possible suspension or expulsion.”

“Students must always be very careful to acknowledge any kind of borrowing that is included in their work. This means not only borrowed words *but also ideas*. Acknowledgement of whatever is not one’s own original work is the proper and honest use of sources. Failure to acknowledge whatever is not one’s own work is plagiarism.” So, ALWAYS err on the side of caution by citing the resources used in preparing your work. Moreover, always use direct quotations for exact wording taken from another source.

All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with the Student Conduct Code. The Code is available for review online at [http://life.umt.edu/vpsa/student\\_conduct.php](http://life.umt.edu/vpsa/student_conduct.php). It is the student’s responsibility to be familiar the Student Conduct Code. The irony of me copying this section of my syllabus, verbatim, from previous syllabi is not lost on me. A healthy sense of irony and comfort with ambiguity will serve you well in my class.

*Disability Accommodations:* Students with disabilities will receive reasonable accommodations in this course. To request course modifications, please contact me within the first two weeks of class. I will work with you and Disability Services in the accommodation process. For more information, visit the Disability Services website at <http://www.umt.edu/dss/> or call 406.243.2243 (Voice/Text).

### *SCHOOL OF BUSINESS ADMINISTRATION MISSION STATEMENT*

The University of Montana’s School of Business Administration is a collegial learning community dedicated to the teaching, exploration, and application of the knowledge and skills necessary to succeed in a competitive marketplace.

*Email:* According to University policy, faculty may only communicate with students regarding academic issues via official UM email accounts. Accordingly, students must use their GrizMail accounts ([netid@grizmail.umt.edu](mailto:netid@grizmail.umt.edu) or [fname.lname@umontana.edu](mailto:fname.lname@umontana.edu)). To avoid violating the Family Educational Rights and Privacy Act, confidential information (including grades and course performance) will not be discussed via phone or email.

### *SCHOOL OF BUSINESS ADMINISTRATION - ASSESSMENT AND ASSURANCE OF LEARNING*

As part of our assessment process and assurance-of-learning standards, the School of Business Administration has adopted seven learning goals for our undergraduate students:

- Learning Goal 1 – SoBA graduates will possess fundamental business knowledge.
- Learning Goal 2 – SoBA graduates will be able to integrate business knowledge.
- Learning Goal 3 – SoBA graduates will be effective communicators.
- Learning Goal 4 – SoBA graduates will possess problem solving skills.
- Learning Goal 5 – SoBA graduates will have an ethical awareness.
- Learning Goal 6 – SoBA graduates will be proficient users of technology.

- Learning Goal 7 – SoBA graduates will understand the global business environment in which they operate.

*Upon successful completion of this course, a student will be able to:*

- Understand the overall lifecycle of a data science project.
- Formulate a data science question from a business question. This process includes identifying metrics and data sets used to answer the question.
- Understand the challenges in data set assembly.
- Visualize data using modern principles and effectively incorporate graphics into storytelling. Demonstrate mastery of basic data visualization techniques as well as being able to articulate the strengths and weaknesses of different graphical approaches. Students will be able to justify never using a pie chart again.
- Students will be well-practiced at communicating the results of analysis via email, slides, or a document.
- Appreciate for the epistemological limits of typical data science approaches. Increased comfort with the uncertainty that lies at the heart of real-world data analysis.
- Tell a story with data. We will practice refining this ability throughout the course.

