Fall 9-2015

BMKT 491.02: Special Topics - Telling the Story with Big Data

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Telling the Story with Data

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Fall 2015, 3 credits
T-Th, 11:10-12:30
CRN 73269

Course Description

This course explores how we turn data into stories that can be understood by nontechnical decision makers. We will work with both raw and summarized data from several industries. In this course we will not write code, but we will work with Excel (as well as learning about other tools including Tableau). 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 Advanced Marketing Analytics (CRN 75165) class. 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. If all goes well the course will culminate in presenting data-driven results to business stakeholders across several companies.

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. *The Signal and the Noise*, Nate Silver, Penguin 2015 (paperback).
2. *Dataclysm*, Christian Rudder, Crown 2014.
3. *The Best American Infographics 2014*, Gareth Cook (Editor), Houghton Mifflin Harcourt, 2014.
4. *Online Marketing Simulations*, Kevin Hillstrom.

Assessment

Students will be evaluated on regular analysis assignments that will roughly follow a two-week cycle as we work with seven 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.

Weekly Email Assignment: 5%

Emails must be sent to bmkt491.2@gmail.com by 9 AM Mountain Time every Thursday. This email can be short and include a link, an article or topic related to data or data science. 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 on-time with zero or one typographical error will receive a 10/10. Each typographical error beyond the first will drop the points by 3. Late emails will have their points docked by 5.

Excel Assignments: 15%

Each week students will be required to perform a small piece of work in Excel. Typically these assignments will have one or more sheets of raw data, an example of what the output is supposed to look like, and a sheet where the student must build a replica of the output using formulas and correctly formatting the sheet. The goal of this assignment is to practice Excel and perform as many tasks as possible without using the mouse.

Analysis Assignments: 60%

Every second Tuesday there will be an analysis assignment due based on the data we have worked with in class. The assignments are due on September 15th, September 29th, October 13th, October 27th, November 10th, November 24th, and December 8th. The specific number of points associated with the assignment will be announced with the assignment and will vary depending on the scope of work.

Class Format

We will strive to have a two-week rhythm in class, although this will not always be possible based on guest lectures and shifting priorities. The plan for this rhythm is as follows:

First Tuesday (weeks 1, 3, 5, 7, 9, 11, 13): analysis assignments due, introduction of new data sets, Excel work, and Excel assignment made.

First Thursday: Check-it-out emails due, lecture, analysis examples.

Second Tuesday (weeks 2, 4, 6, 8, 10, 12, 14): Reading discussion, lecture, working with Excel, analysis assignment check-ins.

Second Thursday: Check-it-out emails due, lecture, analysis assignment check-ins.

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 that the more time-consuming aspects of class (reading and the analysis assignments) happen between Thursday and Tuesday.

Course Outline

We will work with seven principal data sets over the course of the semester, from five different sources:

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. 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 and supply-chain challenges in the deli. This data will be paired with a Wedge effort to do marketing outreach to these customers and, if we're lucky, we'll be able to measure the impact of those efforts.
   b. Customer segmentation and business forecasting. We will use the Wedge data over time to forecast how the business is doing. This analysis will be paired with the book *Online Marketing Simulations.*
   c. Reduction of SKUs. The Wedge is going to be doing a remodel, which will necessitate reducing products by 10-20%. Which products should they drop during the remodel?
3. 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 to understand product affinities and make promotional and stocking recommendations.
4. Marketing Evolution: Marketing Evolution is a leading marketing modeling company. We will look at the type of data they work with and answer some key business questions for them.

5. 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. It is the student's responsibility to be familiar the Student Conduct Code.

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

or fname.lname@umontana.edu). To avoid violating the Family Educational Rights and Privacy Act, confidential information (including grades and course performance) <u>will not be discussed via phone or email</u>.

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.

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