ITM 881: Social Network Analytics
Fall 2016

Du Seg @DuSegC · Sep 25
In red, Volkswagen trying to explain what is unexplicable. In black, people talking about #VolkswagenScandal #ITM890
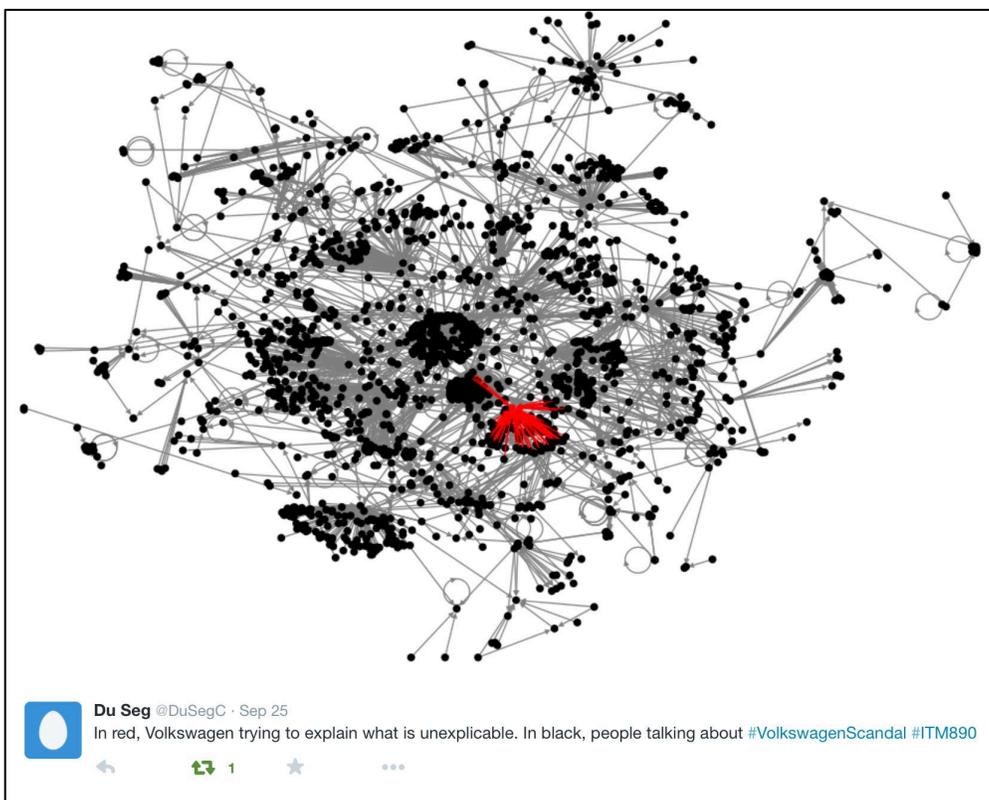
"In the old days, an associate specializing in marketing events for clients might answer to a manager in the marketing department who would be tasked with thinking about why a company should be throwing events in the first place. But now ..his lone event planner can use an array of dashboards she has built to determine exactly how many Facebook likes, Instagram posts and sales arose from a particular event, since all these data are geo-coded and she can watch them change in the wake of an event. It's entirely up to her to decide where, when or whether to hold future events. If anyone were to question her decision, she can simply back it up with data."
        -From "Data Is The New Middle Manager," (WSJ April   19, 2015)

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The proliferation of social networks have dramatically transformed the manner in which enterprises can engage in real-time interactions with customers, and provides newer avenues to enhance brand loyalty,

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competitiveness, growth and profitability. According to some estimates, LinkedIn adds two new users every second, Instagram gets 575 likes per second, and as a country, Facebook would be the 2nd largest in the world. Businesses could ill afford to ignore ways to create and extract value from this phenomenon. This course takes an in-depth look at the seemingly unlimited opportunities to leverage the power of networks and platforms.

The major theme of this course is to highlight how businesses can leverage the state of the art developments in network science. Traditional marketing has always been about the 4Ps: Product, Price, Place, and Promotion. Social media platforms, by contrast, exhibit features of two-sided markets and platforms (including verticals such as gaming, shopping and entertainment). This course will examine how the digital revolution has transformed all of the above, and augmented them with the 5th P of Participation (by consumers). Management of marketing communications is critical for firms today due to the proliferation of media and channels (including social media) as well as an erosion of traditional business models and cost structures (e.g., for digital advertising). Aside from various Internet marketing strategies and applications, the course will cover the business implications of social media such as blogs, micro blogs and product reviews, social networking platforms, viral marketing, search engine advertising and optimization, digital advertising, leveraging the wisdom of the crowds such as open innovation, crowdsourcing and crowdfunding, and mobile analytics.

Topics

Marketing with Social Media: How to design a social media campaign? How do we understand social media marketing using the tools of social network analysis (graph theory, information diffusion)? How is social media marketing different from traditional marketing? What are the key ingredients that make such campaigns successful? How can you make your product and your campaign viral?

Social Media Analytics: How do we gauge the success of social media initiatives? What are the relevant predictive analytics to link social media chatter to business performance? What are best brand strategies on social media? What are best practices for paid and unpaid social media?

Econ0mining User Generated Content: How can firms get useful information from user generated content? How do we utilize methods such as text mining, content analysis and opinion mining capabilities in product development, placement and advertisement decisions? What is the economic value of textual information in online markets? How can we monetize user-generated content on the Internet?

Crowdsourcing and Open Innovation: What are different kinds of crowd-sourcing marketplaces and their business models? What are different kinds of crowd-funding marketplaces and their business models? What factors that influence individuals' decisions to post projects in the marketplace? How are companies using open innovation?

Assignments

Most of the assignments of this course will be hands-on, giving you real life experience of web analytics, search marketing campaigns, recommendation systems, and so on. All assignments will be accessible and doable by students without any programming background. You should be able though to analyze large data sets, either by using Excel, or Access, or some other data analysis tool.

Some sample assignments for this course:
- Analyze (or build) a recommender system for movies, books, and TV Shows using Facebook data
- Analyze a small social network using the Gephi software.
- Evaluate the social media presence of a company.

Course Textbooks and Software
- Derek Hansen, Ben Shneiderman and Marc A. Smith: "Analyzing Social Media Networks with NodeXL: Insights from a Connected World"
- Pang and Lee: Opinion Mining and Sentiment Analysis, free textbook posted on D2L
- Easley, David and Jon Kleinberg: "Networks, Crowds, and Markets: Reasoning About a Highly Connected World." Online book at http://www.cs.cornell.edu/home/kleinber/networks-book/
- Gephi, an open source visualization platform. https://gephi.org/

- Pajek, free software for large-scale network visualization. http://pajek.imfm.si/doku.php

Readings list (Most of them will be posted on D2L)
1. "Social Media" HBS 510095-PDF-ENG
2. "The new conversation: Taking social media from talk to action" HBS 10815-PDF-ENG
3. "It is not the size of a customer's network that matters; it's what they do with it." http://www.wired.co.uk/news/archive/2012-08/13/customer-network-lifetime-value
4. "A Vital New Marketing Metric," http://predictive-marketing.com/index.php/a-vital-new-marketing-metric-the-network-value-of-a-customer/
5. "How valuable is word of mouth?" HBS R0710J-PDF-ENG
6. "Predicting the future with social media" http://www.hpl.hp.com/research/sci/papers/socialmedia/socialmedia.pdf
7. "How to use the new Google Analytics social reporting tool" http://www.socialmediaexaminer.com/google-analytics-social-reports/
8. "Identifying Influential and Susceptible Members of Social Networks"
9. "Networks, Crowds and Markets", Chapter 2 ("Graphs")
10. "Networks, Crowds and Markets", Chapter 3 ("Strong and Weak Ties")
11. "Networks, Crowds and Markets", Chapter 4 ("Networks in their Surrounding Contexts")
12. "Sentiment Analysis and Opinion Mining", Chapter 3 ("Document Sentiment Classification")
13. "Combining knowledge and Data Mining to Understand Sentiment" http://www.sas.com/resources/whitepaper/wp_27999.pdf
14. "Increasing the ROI of Social Media Marketing," HBS SMR431-PDF-ENG
15. "If You Love Something, Let It Go Mobile: Mobile Marketing And Mobile Social Media" HBS BH466-PDF-ENG
16. "Social Media, Traditional Media and Music Sales"
17. "Predicting Individual Behavior with Social Networks"
18. "Demand Media", HBS-511043-PDF-ENG
19. "Social Media Strategy for the Minnesota Wild" by J. Moses, R. Bapna and N. Chervany
20. "Meteor Solutions: Measuring the Value of Social Media Marketing", HBS KEL548-PDF- ENG

Course Projects

A group of at most 4 students can work on a course project. We want to build on two new educational trends – the flipped classroom and crowdsourcing of content. The flipped classroom model in this context refers to the fact that instead of the students analyzing a case according to top-down guidelines, it's the students who gather these materials (much like a researcher) to prepare a business case in the process of finding answers to raise thought-provoking questions. The crowdsourcing of content refers to the collective efforts by the students to create such a repository of content on a given theme. Instead of a centralized system of instructor-led teaching, the entire process of creating these cases for the repository is now distributed across groups of students working closely on a case that interests them.

I will evaluate the course project for the following (the latter two will be weighted more):
      a. Quality of information gathered.
      b. Structured presentation of ideas.
      c. Quality of issues identified (quantitative or based on sound logical analysis).

Course Contributions

We will use a collaborative platform called YellowDig to enabled decentralized collaboration and continue the conversation beyond the classroom. I will evaluate the quality and quantity of your course contributions on this platform.

Grading

Item	Points	Approx %
Class Participation (Qualitative)	100	20%
Course Contributions ▪ Note Taker (20) ▪ Blog Report (40) ▪ Tweets (minimum 4 x 10 = 40)	100	20%
Assignments	150	30%
Course Project (Group of 4 students) ▪ Mid-Term Status Presentation (30) ▪ Bi-weekly Status Checkpoints (30) ▪ Client Assessment (30) ▪ Peer Evaluation Adjustment (+/- 90)	100	20%
Midterm	50	10%
Total Score	500	100%

Course Schedule (Tentative and Subject to Change)

Date	Topic	Readings	In class exercises
9/1	Introduction	Overview and course plan Student teams identified and start gathering project information	
9/6	Social media analytics & customer network value	"How valuable is word of mouth?" HBS R0710J-PDF- ENG	
9/8	Social network basics	Networks, Crowds and Markets", Chapter 2 ("Graphs"), 3 ("Strong and Weak Ties")	NodeXL Tutorial
9/13	Social network metrics	"Analyzing Social Media Networks with Node XL", Chapter 5 ("Calculating and Visualizing Network Metrics")	GA Social Reporting Social Network Metrics
9/15	No Class- Career Fair		
9/20	Small World Networks	Small World Networks and Power Laws	Gephi Tutorial
9/22	Real World Networks	Small Worlds "Analyzing Social Media Networks with Node XL", Chapters 10 & 11, Facebook Graph Search	Twitter Data Crawler
9/27	Real World Networks	"Analyzing Social Media Networks with Node XL", Chapter 7 ("Clustering and Grouping"); "Networks, Crowds and Markets", Chapter 4 ("Networks in their Surrounding Contexts")	Gephi and NodeXL for Twitter data
9/29	Real World Networks	"How Twitter Users can Generate Better Ideas" "Mapping Twitter Topic Networks: From Polarized Crowds to Community Clusters"	YouTube API Tutorial
10/1	**Assignment 1**	**"Demand Media" case study**	
10/4	Community Structure	Community Structure Detection and Mining Networks; Network Visualization	Community structure; Networkx tutorial
10/6	Real World Networks	Case Discussion: "United Breaks Guitars" HBS 510057-PDF-ENG Case Discussion: "Porsche: The Cayenne Launch" HBS- 511068-PDF-ENG "Social Media" HBS 510095-PDF-ENG	
10/11	Text Mining	Networks and Text Mining; Link Prediction	
10/13	Text Mining	"Mine Your Own Business: Market-Structure Surveillance Through Text Mining"	Term co-occurrence networks; Product Networks in Gephi
10/18	Text Categorization	Opinion Mining and Sentiment Classification	NLP tutorial; NLTK exercises
10/20	Social Influence	Social Networks and the Diffusion of User-Generated Content; Identifying Influential and Susceptible Members of Social Networks"; Distinguishing influence-based contagion from homophily-driven diffusion in dynamic networks; Take-home midterm handed out	Predicting Social Media Activity with Weka
10/21	**Assignment 2**	**"Social Media Strategy for the Minnesota Wild" case write-up**	
10/25	Networks & Influence	Guest Speaker: Sean Taylor, Data Scientist, Facebook	

10/27	Text Mining	Text Mining and Machine Learning	Senti Strength tutorial
10/31	**Assignment 3**	**Twitter Data Analysis**	
11/1	Text Mining	Text Mining and Machine Learning; Self-learning classifiers	Lightside tutorial
11/3	Product Networks	Multidimensional scaling; Graph Mining	
11/8	Privacy	Social Networks and Privacy	
11/10	Deep Learning	Recursive Deep Learning Models	Gensim and word2vec tutorials
11/15	Crowdsourcing	Crowdfunding and crowdsourcing; Gamification; Markov Chains	
11/17	Supply Networks	Buyer Supplier Networks	Kickstarter API tutorial
11/18	**Assignment 4**	**Multidimensional scaling**	
11/24		**No Class - Thanksgiving**	
11/29	Social Media ROI	Increasing the ROI of Social Media Marketing," HBS SMR431-PDF-ENG; "Using Social Media Data to Track the Effectiveness of a Marketing Campaign" CU-135-PDF-ENG;	
12/1	Sharing economy	"Connected Consumption" ROT-234-PDF-ENG; "CAR2GO" Case W13611-PDF-ENG	
12/6	Freemium models	High Note case study and Freemium models Guest Speaker: Shawndra Hill, Microsoft Research	
12/8	Course wrap-up	Take home final distributed	