15.570  Fall 2015
Digital Marketing & Social Media Analytics
Professor Sinan Aral
T / TH: 1-230pm Room: E62-262
230-4pm Room: E62-262

Instructor  Professor Sinan Aral
Classroom  E62-262
Class times  Tuesdays and Thursdays, Section A: 1-230pm / Section B: 230-4pm
TAs  Section A: Nicholas Van Niel <nvanni@mit.edu>
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Summary and Objectives

New digital technologies have fundamentally reshaped marketing theory and practice in the last decade alone. Technology has changed the modes of communication through which firms engage with consumers. Moore's law has made the storage and analysis of consumer data scalable, creating opportunities for fine grained behavioral analytics. New monitoring tools have fostered precise and personalized customer relationship management practices. The rise of mobile phones and tablets has enabled location based messaging and reciprocal communication. The ubiquity of video content has promulgated rich, native advertising programs. The global emergence of social networking has enabled networked based predictive modeling and new forms of targeting and referral strategies based on the preferences of consumers' peers. And finally, new social media have brought all of this onto the public stage, with word of mouth conversations driving brand awareness and brand loyalty, and user generated content on review and ratings sites making or breaking demand for products or services.

15.570 will provide a detailed, applied perspective on the theory and practice of Digital Marketing and Social Media Analytics in the 21st century. We will cover topics like Search Marketing, Social Network Marketing, Social Media Analytics, Inbound Marketing, User Generated Content Management and Marketing, Mobile Advertising and Commerce, CRM Strategy in the Age of Big Data and Digital Advertising from the display ad ecosystem to ad retargeting. We will cover concepts such as the difference between earned and paid media, predictive modeling for ad targeting and customer relationship management, measuring and managing product virality, viral product design, native advertising, and engaging the multichannel experience. Throughout the course we will specifically stress the theory and practice of randomized experimentation, AB testing and the importance of causal
inference for marketing strategy. The course will combine lectures, case studies and guest speakers with relevant industry experience that speak directly to the topics at hand.

Upon completion of this course you should have a fundamental understanding of:

- Digital Advertising Ecosystem and Attribution and Pricing Models for Digital Advertising;
- An understanding of the fundamentals of Web and App Analytics and KPIs for Web traffic and commerce;
- Search Engine Marketing; Search Engine Advertising; Ad Auctions and Strategies for optimizing Search Engine Advertising;
- Social Network Marketing, Social Network Targeting; Predictive Analytics using Social Network Data, Peer-to-Peer Marketing and Personalized Social Advertising;
- Targeting and Segmentation, specifically: Demographic Targeting and Segmentation, Behavioral Targeting and Segmentation, Social Targeting and Segmentation;
- Twitter Analytics and Applied Twitter Analytics (e.g. Social TV and Social News);
- Social Listening: Analysis of User Generated Content, Reviews, Ratings and their effects on consumer demand; and
- Mobile Commerce and Analytics.

Students are expected to be properly prepared for the class and to have thoroughly read the assigned readings and cases. Students are expected to participate actively in class discussion.

**Course requirements**

Details about the assignments, projects and deliverables as well as the data that we will use to examine them will be forthcoming throughout the semester. However, the following provides a sketch of the four main requirements of this course. These four requirements describe completely the deliverables and activities students will be evaluated on:

1. **Class Participation:**

   It goes without saying that a vibrant class discussion is **essential** to the learning outcomes of the class. Being properly prepared for class and participating in the class is a requirement. We will be keeping track of everyone’s contributions and will **reward productive participation.** Note: we mean productive participation, not just participation. A productive comment is one that guides the class to learn more, dig deeper, understand more comprehensively etc. Just talking is at times even counterproductive. So, focus on productive participation, not just participation.

2. **Discussion Questions:**

   Each week, you will typically be assigned pre-class work a week in advance of the session. Your responses, designed to have you reflect on the readings, **should not exceed one page.** This is not designed to create a lot of work, but rather to encourage you to read and reflect on the readings **before** class. You will be asked to submit answers to discussion questions pertaining to the reading via Stellar **before class starts on the day they are due (e.g. 12:59pm or 2:29pm depending on your section).** 6 of the 11 class sessions will have Discussion Questions assigned. You will be asked to submit **5 out of 6 assignments** during the semester. Two of those session assignments - **Sessions 7 and 12,** corresponding to case readings - are required of all students and are not optional.
then be able to choose 3 of the remaining 4 sessions in which discussion questions are assigned. The schedule below lists weeks in which Discussion Questions are assigned (DQ) and weeks in which required Discussion Questions are assigned (RDQ).

3. **Individual Project (“Jumping the Shark”):**

The **Individual Project** builds directly off of the session on Social Network Marketing and Viral Product Design. The individual project is designed to give students an understanding of viral dynamics and the dynamic processes of new user acquisition, viral sharing, viral product design, community carrying capacity etc. The project involves analyzing a simulated dataset of viral user acquisition, adjusting and tuning the parameters, establishing the key factors that govern viral growth processes, describing sustainable strategies for viral growth under several assumptions and recommendations to improve the viral model itself. A model and dataset of user acquisition will be provided and each student will be asked a series of questions that explore the data and the model.

4. **Group Project (“A Holistic Digital Marketing Strategy for High Note, Inc.: Marketing to Freemium Communities”):**

The **Group Project** involves an in depth analysis of Digital Marketing Strategy at High Note, a real online music streaming community whose name has been changed to preserve the privacy of its consumers. You will form a **project team of either 2 or 3 people** in the early weeks of the class (**team assignments are due by 11/5**). During the semester you will familiarize yourselves with the case materials and the data, yes the data! ... We have **9 months of real customer data from the firm, totaling over 100K observations**. The data details a) demographic, b) behavioral and c) social network characteristics of users.

The purpose of the project is to get real, firsthand experience with data driven marketing strategy. In particular, you will be tasked with creating a **Digital Marketing Strategy aimed at Monetizing the Service -- i.e. a strategy for increasing the number of paying subscribers**. One might think about many different approaches, from generating new premium customers to converting current subscribers to the paid premium service. Your goal will be to make a series of recommendations to the CMO of the company detailing how you think she should devise her marketing strategy toward this end. The catch is that **your recommendations will need to be backed up by evidence** -- evidence from analysis of the company’s data as well as any evidence from publicly available data you want to collect about online music streaming, freemium models and the various digital marketing strategies that she may want to implement (strategies we learned about in class, e.g. Search Advertising, Mobile Advertizing, Social Network Marketing, Display Advertising etc).

There will be deliverables for the project:

a) **Team Formation Plan (Due 11/5 – 5%)** (1 Paragraph) will describe how you formed a balanced team of 2-3 members with complementary skills that will represent the management team of the project. The plan will list the names of your team members and describe why each person was recruited into the project based on the relevance of their skills and experience (2-4 sentences).

b) **Project Plan (Due 11/24 - 30% of the Grade):** The **Project Plan** (~ 1-2 pages) will detail what your team plans to do to investigate the various marketing strategies that you might recommend. The plan will describe questions you are asking of the data, research you are doing or will do,
analyses you are conducting or will conduct etc toward preparing a final report. Roles and responsibilities of different team members should be outlined and a rough timeline of activities should be presented.

c) **Final Report (Due 12/11 - 65% of the Grade):** The Final Report (~ 6-8 pages) will detail your recommendations to the High Note CMO. It should consist of an **Executive Summary** (~ 2 pages), which details the recommendations that you are making and a high level justification for those recommendation; as well as an **Appendix** (~ 4-6 pages) which shows your work and justifies the recommendations made in the Executive Summary with evidence (e.g. analyses of consumer data, outside data). Justifications might include regression analysis and predictive models of premium subscription behavior built using the consumer data (e.g. a) demographic, b) behavioral and c) social network characteristics of users); reports of high level summaries of the means and standard deviations in the data; correlation analysis linking a) demographic, b) behavioral and c) social network characteristics of users to premium subscription behavior; evidence from statistics about various digital marketing strategies we learned about in class (e.g. Search Advertising, Mobile Advertising, Social Network Marketing, Display Advertising etc).

**Grading**

Individual Pre-Class Assignments: 20%
Individual Assignment: 20%
Participation in Class Discussion: 20%
Group Project: 40%
# Class Schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Session</th>
<th>Assignment Due</th>
<th>Guest/Case</th>
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</thead>
<tbody>
<tr>
<td>10/27</td>
<td><strong>Introduction to Digital Marketing Strategy</strong></td>
<td></td>
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<tr>
<td>10/29</td>
<td><strong>Digital Advertising &amp; Attribution</strong></td>
<td>DQ</td>
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<tr>
<td>11/3</td>
<td><strong>Search Advertising</strong></td>
<td>DQ</td>
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<tr>
<td>11/5</td>
<td><strong>Web Analytics &amp; Experimentation</strong></td>
<td>DQ / HN: Teams</td>
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<tr>
<td>11/6</td>
<td><strong>Optional Recitation I: 1-2PM</strong></td>
<td>E51-085</td>
<td>E51-372</td>
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<tr>
<td>11/10</td>
<td><strong>Social Network Analytics &amp; Viral Product Design</strong></td>
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<tr>
<td>11/12</td>
<td><strong>Social Listening: Ratings, Reviews &amp; Demand</strong></td>
<td>Jumping the Shark</td>
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<tr>
<td>11/17</td>
<td><strong>Data Driven Advertising</strong></td>
<td></td>
<td>Claudia Perlich</td>
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<tr>
<td>11/19</td>
<td><strong>Data Mining &amp; Digital CRM Strategy // Group Project: “Freemium Marketing”</strong></td>
<td>RDQ</td>
<td>Harrah’s Case</td>
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<td>11/20</td>
<td><strong>Optional Recitation II: 1-2PM</strong></td>
<td>E62-262</td>
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<tr>
<td>11/24</td>
<td><strong>Inbound Marketing</strong></td>
<td>HN: Project Plan</td>
<td>Brian Halligan</td>
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<td>11/26</td>
<td><strong>Thanksgiving - NO CLASS</strong></td>
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<td>12/1</td>
<td><strong>Personalized Social Marketing</strong></td>
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<td>Jamie Tedford</td>
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<tr>
<td>12/3</td>
<td><strong>Mobile Commerce &amp; Analytics</strong></td>
<td>DQ</td>
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<tr>
<td>12/8</td>
<td><strong>A Holistic Digital &amp; Social Strategy</strong></td>
<td>RDQ</td>
<td>Sephora Case</td>
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<tr>
<td>12/11</td>
<td><strong>End of Class (Group Project: “High Note” Due)</strong></td>
<td>HN: Final Report</td>
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Reading List

Most reading materials can be found on Stellar. Those materials not on Stellar (including the High Note Group Project Materials) will be available in the Study.net course pack.

Session 0: Group Project Materials
5. Group Project Materials: “High Note Data” (CSV/Excel File)

Session 1: Introduction to Digital Marketing Strategy (10/27):

Session 2: Digital Advertising & Attribution (10/29):

Session 3: Search Advertising (11/3):
10. “Paid Search Advertising Background Note” Rajkumar Venkatesan & Shea Gibbs (2014); Darden Business Publishing; UVA; May 27.
11. “Paid Search: The Innovation that Changed the Web” Des Laffey (2007); Business Horizons

Session 4: Web Analytics & Experimentation (11/5):
Optional Reading:
15. “Web Analytics Definitions v.4.0” Jason Burby, Angie Brown & WAA Standards Committee; WAA.

Session 5: Social Network Analytics & Viral Product Design (11/10):
Optional Reading:

Session 6: Social Listening: Ratings, Reviews & Demand (11/12):

Optional Reading:

Session 7: Data Driven Advertising (Claudia Perlich, Distillery) (11/17):

Session 8: Data Mining & Digital CRM Strategy (11/19):

Session 9: Inbound Marketing (Brian Halligan, Hubspot) (11/24):
27. “Shopping Has Changed, Has Your Marketing?” Brian Halligan and Darmesh Shah (2010); Inbound Marketing: Get Found Using Google, Social Media & Blogs; John Wiley & Sons, Inc.

Session 10: Toward Personalized Social Marketing: Jamie Tedford (Brand Networks) (12/1):
30. Take a breather! You’re off the hook for any reading today 😊. You should spend this time reading the group project materials and taking time to make progress on the project with your team!

Session 11: Mobile Commerce & Analytics (12/3):

Session 12: A Holistic Digital & Social Strategy (12/8)
Guest Speakers

JAMIE TEDFORD
CEO, Brand Networks

Jamie Tedford is the CEO and founder of Brand Networks. Prior to founding Brand Networks in 2007, Jamie was SVP, Marketing and Media Innovation at Arnold Worldwide, a top-10 US brand advertising agency. Recognized as an innovative entrepreneur and a pioneer in the growing “Word of Mouth” industry, Jamie launched the WOM division at Arnold and is a founding board member of the Word of Mouth Marketing Association. Jamie is a graduate of the University of New Hampshire, and he lives in Marblehead, Mass.

CLAUDIA PERLICH
Chief Scientist, Dstillery

Claudia Perlich serves as Chief Scientist at Dstillery and in this role designs, develops, analyzes and optimizes the machine learning that drives digital advertising to prospective customers of brands. An active industry speaker and frequent contributor to industry publications, Claudia enjoys serving as a guide in world of data, and was recently named winner of the Advertising
Research Foundation’s (ARF) Grand Innovation Award and was selected as member of the Crain’s NY annual 40 Under 40 list. Additionally, she has been published in over 30 scientific journals, and holds multiple patents in machine learning. She has won many data mining competitions, including the prestigious KDD Cup three times for her work on movie ratings in 2007, breast cancer detection in 2008, and churn and propensity predictions for telecom customers in 2009, as well as the KDD best paper award for data leakage in 2011 and bid optimization in 2012. Prior to joining Dstillery, she worked in Data Analytics Research at IBM’s Watson Research Center, concentrating on data analytics and machine learning for complex real-world domains and applications. Claudia has a PhD in Information Systems from NYU and an MA in Computer Science from the University of Colorado. Claudia takes active interest in the making of the next generation of data scientists and is teaching “Data Mining for Business Intelligence” in the NYU Stern MBA program.

BRIAN HALLIGAN
Co-Founder and CEO, Hubspot

Brian Halligan is co-founder and CEO of HubSpot. Prior to HubSpot, Brian was a venture partner at Longworth Ventures and a VP of sales at Groove Networks, which was later acquired by Microsoft. He has authored two books, Marketing Lessons from the Grateful Dead and Inbound Marketing: Get Found Using Google, Social Media, and Blogs which he co-wrote with Dharmesh Shah. Brian serves on the boards of directors of Fleetmatics Group (FLTX), a global provider of fleet management solutions, and the Massachusetts Innovation and Technology Exchange (MITX). Brian was named Ernst and Young’s Entrepreneur of the Year in 2011 and one of Glassdoor’s 25 Highest Rated CEOs in 2014. In his spare time, he follows his beloved Red Sox, goes to the gym, and teaches a class at MIT Sloan with Paul English, "15.392: Designing, Developing, and Launching Successful Products in an Entrepreneurial Environment."