# MBA 6240:
# Competing in a Data-Driven Digital Age
## Spring 2017 (Term A)

## Instructional Staff

*Instructor:*          Gordon Burtch

**Email:**             gburtch@umn.edu
**Phone (Cell):**      (215)688-3852
**Office:**            CSOM 3-368
**Office Hours:**      Tuesdays, 2:00 – 3:30pm (or by appointment).
**Home Page:**
http://www.carlsonschool.umn.edu/faculty-research/faculty.aspx?x500=gburtch

*Teaching Assistant:*   Scott Schanke

**Email:**             schan067@umn.edu
**Office:**            TBD.
**Office Hours:**      By appointment (grading questions).

## Course Description

Using the foundation of data-driven business analytics, this course provides the tools and frameworks for competing and operating more intelligently in the digital age. Recent MIT research shows 9% higher top line and 26% higher net margins for companies that have 'Leading Digital' capabilities, namely social, mobile, and analytics (the fourth being cloud). Students will learn general state-of-the-art analytics skills in the context of managing the IT function, new platform based business models, digital search, big-data, social networks, social media and open innovation. These skills will include the fundamentals of predictive modeling, A/B testing, social network analysis and an exposure to the workhorse tools of data-driven classification and prediction to explore patterns in rich datasets. While this course will use case studies in the digital domain, the methods taught here have a wide range of applicability across functions and verticals in modern business environments.

A key aspect of emerging digital and social media technologies is the data-driven analytics opportunities they generate. While most firms have the capability to collect and summarize data, few have the analytical abilities to gain true insights from it, to drive decision-making. The course is hands-on, with an emphasis on problem solving and generating insights from data-rich cases in the digital context. The course discussion will

be complemented by faculty members' cutting-edge projects and various business consulting assignments that the professor has been involved in over the last few years.

## Course Objectives

This course is intended to prepare students for the rapidly changing digital environment faced by many companies, and to inform students on how businesses can leverage data-driven decision-making and digital phenomena to survive and grow.  At the completion of this course, students will understand:

1. How and why IT is disrupting long-standing industries
2. Aspects of platform strategy and competition as it relates to multi-sided markets
3. Digital search and advertising
4. Social networks, peer influence and social contagion in the spread of ideas, products and services
5. Open innovation and crowdsourcing
6. Characteristics and implications of new business models (e.g., the sharing economy)

During the course of the term, you will learn to apply the following methods, solving real world cases, using real world datasets:

1. Design and execution of randomized experiments (A/B tests), as well as the analysis and interpretation of resulting data
2. Linear models and the estimation of elasticities (e.g., price elasticity)
3. Association rule mining, classification and regression trees, k-NN
4. Social network analysis

## Teaching Methods

### Class Time

We will spend each classroom session covering lecture and case material. Common sense suggests that mixing lecture with group discussion and individual reflection can enhance learning. You can expect lecture balanced with class discussion, as well as some short individual or group activities. You are expected to come to class prepared, having read the assigned readings, in order to contribute to class discussion in a meaningful way.

*Software*

In this course we will primarily use the R statistical language http://cran.r-project.org/. R is an open-source statistical software package that is freely available for most major operating systems, including Windows and Mac OSX. Please download and install the latest version as soon as possible.

In addition to the R core (the software that runs your code), you will want to download and install R-Studio http://www.rstudio.com/. This is a high quality development environment for the R language that makes interfacing with the package very user friendly. This is also free.

An excellent tutorial for R can be found at http://lynda.umn.edu entitled "Up and Running with R." The first few modules walk you through downloading and installing R and R-Studio, as well as setting up the environment to get started. You should complete at least the first two modules, and I encourage you to complete the entire tutorial to get a better sense of basic statistical functionality in R.

Finally, one of the assignments, related to Social Networks, will make use of Gephi, an open source tool for social network analysis. You can download and install Gephi from https://gephi.org. Please plan to download this software onto your laptop before Feb 13th, as I will provide a demo of the tool at that point so you can use it in the homework.

## Course Location & Website

All classes will take place on **Mondays and Wednesdays**, from **9:55am to 11:35am (Section 001, CSOM 1-147)** and **1:45pm to 3:25pm (Section 002, CSOM 1-123)**. All course-related materials (required readings, lecture slides, assignments, grades, etc.) will be posted on the course website, which is available to all registered students through Moodle (https://ay16.moodle.umn.edu).

## Course Materials & Readings

Throughout the duration of the course, we will be drawing upon a number of Harvard-style business cases, as well as articles and material from the popular press, all of which pertain to the course content. Some of these cases come paired with real-world datasets, which we will also explore to provide you with some exposure to working with data. The majority of these materials have been included in our course pack, accessible via a link on Moodle. Any additional readings will be posted to Moodle and brought to your attention during lecture.

## Grading Distribution & Scale

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| **(1) Participation:** | 10%. |
| **(2) Group Assignments (x3):** | 45%. |
| **(3) In-Class Midterm Exam:** | 20% |
| **(4) In-Class Final Exam:** | 25%. |
| **Total:** | 100%. |

**Participation:** Class participation, in the form of discussion and engagement, both offline and online, is expected. Students will be evaluated individually, and through in-class exercises. Large portions of the class are case based, so please come to class prepared for discussion.

Effective participation depends on you consuming course materials prior to class, and considering how that material may relate to your own prior experiences. You are expected to enhance the overall learning environment of the class by coming prepared, asking questions and bringing issues to life, based on your experiences.

Given the focus of this course, we need to practice what we preach (the effective use of digital media). One way to grasp the power and limitations of social media is to experience it directly. Accordingly, we will use YellowDig to manage discussion and interaction outside of class. YellowDig is a Reddit-like platform that allows users to share articles and online media in a discussion-thread format, as a way for us to keep the class discussion alive between meetings. The YellowDig board is accessible via the course Moodle page.

Students are encouraged to contribute to the YellowDig forum on an ongoing basis, sharing relevant articles and material, raising pertinent issues that extend the depth of the class discussions. Credit for online participation will be based on student contributions to the YellowDig board. Credit will be given to those who *initiate* interesting threads of discussion (i.e., those that capture others' attention and elicit a response), and to those who respond in a thoughtful manner. Yellowdig has a built-in point system that enables measurement of these activities at the student level. I will use that point system as an important input to your final grade. Note that the maximum points you can earn in any given week or day is capped, thus sustained participation over the course of the semester will be necessary to earn top marks.

**Group Assignments:** You should form into groups of 4-6 as early as possible. In these groups, you will complete three assignments, in addition to working on some group based in-class activities. For each group homework assignment, you will present your submission remotely, using VoiceThread: [http://it.umn.edu/moodle-26-28-prepare-use-voicethread](http://it.umn.edu/moodle-26-28-prepare-use-voicethread). To get you familiar with VoiceThread, there is an initial task you will need to complete by the 3$^{rd}$ session.

**Midterm & Final Exams:** The two exams will consist of multiple-choice, true/false, and short answer questions intended to evaluate your understanding of the course material, and possibly one essay-style question. The exams will be administered using paper and pencil, in-class, and will be closed book and closed notes. Note: I will hold a review session just prior to the final exam.

## Group Assignments

**Pipes to Platforms:** This assignment will be posted before the third session of the class, in week 2, but it will not be due until the very end of the course. For the submission, you will be asked to identify a business that is employing a "pipe" model that you feel would be ripe for transition to a "platform model." You will be asked to describe the business model, the company's market position and considerations for making such a transition. You will be asked to articulate ways that the business might proceed with a transition to a platform strategy, possible variants of such a strategy, important considerations, pricing and revenue, etc.

**Air France Search:** This assignment will be posted prior to our first session on digital search. The assignment itself pertains to digital search, and will be based on the Kellogg Air France Search case. You will be provided with a sample of data drawn from Air France's sponsored search advertising campaigns, across various search engines, and asked to pick one search engine and offer some simple data-based insights for how the campaigns might be improved. No need to use R here, Excel and pivot tables and so forth will be sufficient, though you can of course feel free to get more advanced if you are comfortable doing so.

**Social Network Analysis:** In the final assignment, you will use Gephi, an open source tool for social network analysis that is freely downloadable and which runs on most computing platforms. You will be asked to construct / visualize a network based on the Twitter live stream, focusing on a hashtag of your choosing. You will be asked to plot the network, describe it, and answer a few questions about its composition, key players in the network, etc.

## Course Guidelines & Academic Policies

**Online Submissions:** All assignments will use online submission via the course Moodle page. Online submission provides a number of advantages to the course staff and students, including date/time stamping and confirmation/verification of your submission. If you are not familiar with the online submission process, please plan to make your first few submissions early so that you have the opportunity to address any issues. For a variety of reasons, you should not email assignments to the instructor or TA unless specifically requested to do so. *When submitting a VoiceThread link for a group presentation, it is important to note that you must 'share' access to the VoiceThread*

*presentation with each of the TA's, as well as the instructor, else we will not be able to view it (or grade it).*

**Academic Misconduct / Individual Work:** When not otherwise specified, homework should be considered individual work. While collaboration on homework assignments is encouraged, work submitted should be that of the individual student submitting it. Examples of legitimate collaboration include, but are not limited to:

- Describing to another student – including showing him or her on your screen or hard copy – how you approached a particular aspect of the assignment.
- Reuse of designs shared with you on paper or on screen by another student.
- Posting sample designs to the forum or using designs posted by the instructor or other students.
- Reuse of designs found on the Internet (through Google, etc.). Learning to adapt and reuse designs that you did not write is an important skill.

Academic misconduct is defined as being in possession of an electronic copy of another current or former student's work. This provides a simple mechanism for you to evaluate whether or not you are in compliance with this policy. Work that appears to be an electronic copy, or derived from an electronic copy, of another student's work will be submitted to the respective academic office as evidence of academic misconduct. For the first violation, students will receive no points for the assignment in question. For the second violation in a given semester, the student will receive an F for the current course.

**Accommodations for Students with Disabilities:** The University of Minnesota is committed to providing all students equal access to learning opportunities. Disability Services is the campus office that works with students who have disabilities to provide and/or arrange reasonable accommodations. Students registered with Disability Services, who have a letter requesting accommodations, are encouraged to contact the instructor early in the semester. Students who have, or think they may have, a disability (e.g. psychiatric, attentional, learning, vision, hearing, physical, or systemic), are invited to contact Disability Services for a confidential discussion at 612-626-1333 (V/TTY) or at ds@umn.edu. Additional information is available at the DS website (http://ds.umn.edu).

| DATE | TOPIC | ASSIGNMENTS POSTED / DUE | READINGS / TASKS (Links Available on Moodle) |
|---|---|---|---|
| Jan 18 (W) | **Digital Forces of Change:** Digital Disruption & What It Means<br><br>**Introduction to R:** A Demonstration | Group VoiceThread Task Posted | **Reading:** Navigating a World of Digital Disruption: *BCG Perspectives*<br><br>What is Disruptive Innovation? *HBR Article R1512B-PDF-ENG*<br><br>Big Bang Disruption: *HBR Article R1303B-PDF-ENG* |
| Jan 23 (M) | **Platform Competition (1):** A Way Forward? | In-Class Exercise: Two-Sided Markets | **Reading:** Pipes, Platforms, and the New Rules of Strategy: *HBR Article R1604C-PDF-ENG*<br><br>Parker et al. Platform Revolution (Chapters 1 and 2)<br><br>Platform Envelopment *Strategic Management Journal* |
| Jan 25 (W) | **Platform Competition (2):** A Way Forward? | 1st Group Assignment Posted (Pipes to Platforms)<br><br>Group VoiceThread Task Due (Jan 27) | **Reading:** Products to Platforms: Making the Leap: *HBR Article R1604E-PDF-ENG*<br><br>**Case:** Intuit Quickbooks: From Product to Platform, *HBS Case 714433-PDF-ENG* |
| Jan 30 (M) | **Big Data & Business Analytics** | | **Reading:** Are You Ready for the Era of 'Big Data'? *McKinsey & Co.*<br><br>Report on Big Data: *Economist Intelligence Unit* |
| Feb 1 (W) | **Data Mining 101:** Basic Algorithms for Exploration & Prediction | | **Reading:** Provost et al. Data Science for Business (Chapters 1 and 2) |
| Feb 6 (M) | **In-Class Midterm Exam** | | |
| Feb 8 (W) | **Digitization of Search & Display Advertising:** Part 1 | 2nd Group Assignment Posted (Air France) | **Reading:** Secret of Googlenomics: *WIRED Magazine*<br><br>**Case:** Air France Internet Marketing: *Kellogg Case KEL-3196-PDF-ENG* |

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| Feb 13 (M) | **Digitization of Search & Display Advertising:** Part 2 | In-Class Exercise: CloverLeaf – Understanding Search Ranks<br><br>In-Class Exercise: StarDigital – Evaluating an A/B Test | **Case:** Star Digital – Assessing the Effectiveness of Display Advertising: *Stanford GSB Case M-347*<br><br>Clover Leaf Advanced Search: *UMN SOBACO Case* |
| Feb 15 (W) | **Social Media & Networks:** Part 1 – Peer Influence & Social Networks | 2$^{nd}$ Group Assignment Due (Air France)<br><br>3$^{rd}$ Group Assignment Posted (Social Networks) | **Reading:** Do Your Friends Make You Pay? *Management Science*<br><br>Identifying Influential and Susceptible Members of Social Networks" *Science Magazine* |
| Feb 20 (M) | **Social Media & Networks:** Part 2 – The Social Enterprise and Mastering Freemium | | **Case:** The Ford Fiesta: *HBS Case 511117-PDF-ENG*<br><br>High Note's Freemium Conundrum: *UMN SOBACO Case* |
| Feb 22 (W) | **Expanding the Boundary of the Firm:** Crowdsourcing & Crowdfunding | 3$^{rd}$ Group Assignment Due (Social Networks) | **Reading:** Using the Crowd as an Innovation Partner *HBR Article R1204C*<br><br>Tapping Into the Wisdom (and Wealth) of Crowds: *IBIT Report*<br><br>**Case:** Innocentive.com *HBS Case 9-608-170.* |
| Feb 27 (M) | **New Business Models:** Understanding the Collaborative Economy & the Blockchain | 1$^{st}$ Group Assignment Due (Pipes to Platforms) | **Reading:** Sundararajan The Sharing Economy (Chapters 1 and 2)<br><br>The Truth About Blockchain *HBR Article R1701J*<br><br>Simple Economics of the Blockchain *NBER Working Paper* |
| Mar 1 (W) | **Review Class** | | |
| Mar 6 (M) | **In-Class Final Exam (Cumulative)** | | |