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BMKT 680.01: Big Data and Innovation

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Big Data and Innovation
BMKT 680, Section 1 (3 credits)
BMKT 591/Advanced Analytics (1 credit)

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Class Time: 3:30-4:50 M/W   **Class Location**: (2nd floor, GBB/west corner room)
Office Hours: 1:30-3:30 Tuesdays and by appointment.
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Prerequisites for this course include the core courses in the MSBA.
Required Readings: Available on Moodle.

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Course Content: This is the capstone course for the MSBA program. As such, students will be expected to demonstrate proficiency across the six learning objectives for the program and there will be assignments geared to assess each of them for this class:

1. Knowledge ➔ … of a wide range of analytical techniques and programming tools for both structured and unstructured (e.g., text, sentiment) data.

2. Application ➔ …of appropriate analytical techniques to solve a wide variety of business/ organizational problems.

3. Communication/Story Telling ➔ … of data analytics results …. through effective business decision making inputs; …. data visualization techniques ….impactful narrative supporting key insights from analysis.

4. Ethics/Data Stewardship➔ … to secure data, develop policies for ethical use of data, respect of data privacy.

5. Innovation ➔ Ability to innovate beyond answers existing questions and solutions known problems—harnessing data analytics to identify new sources of value; to see patterns and anomalies; and to reveal new insights.

This class offers students the opportunity to reflect on how data science can be leveraged for innovation and for solving "big problems". In that sense, this course focuses on both a strategic perspective (the power of big data to unleash new insights and innovations) as well as an integrative perspective of the program (through a project-based synthesis). In addition to providing a capstone experience for the program, this course also will help train students--future managers-- to think strategically and innovatively—about data, about opportunity, about value. It will ensure that

graduates are proficient in strategy, customer value, and insights so they are prepared to be promoted to leadership positions in their organizations.

<u>Specific learning objectives include:</u>
1. Understanding of the nature of innovation and disruption and how big data can be used to inform innovation & disruption; integrating knowledge of data science and business analysis to develop innovations
2. Stimulating right-brain thinking through learning creativity protocols, applying them to specific problems, and other "creative" activities
3. Rapidly launching a content project informed by both data and creativity
4. Exploring tensions in data privacy from multiple perspectives
5. Conceptualizing and completing a capstone project as an integrative experience for the program
6. Presenting the capstone project in a conference-like format for business professionals

<u>Learning Outcomes:</u>
At the completion of this course, students will be able to:
1. Apply creative thinking and innovation models to discover new solutions to solve user/customer/business/societal problems;
2. Scope a data science project from the perspective of solving user problems (including customers as well as society);
3. Developing content marketing based on data science
4. Having a nuanced understanding of privacy concerns from the business, customers, societal, and policy perspectives
5. Conceptualize and complete an integrative, capstone project, which includes surfacing new insights for addressing user needs.
6. Communicate effectively with non-technical managers and executives, through visual storytelling, written, and oral communications.

<u>Rough Outline for Course:</u>
The substantive focus of the first five weeks (roughly) will be on the Creativity & Innovation component.

The second five weeks (roughly) will work through rapid iterations of using data and creative brainstorming to create innovative content AND developing this content through data-driven strategies.

The third five weeks (roughly) will apply these models of innovative thinking to an existing data set to (a) surface new insights; (b) develop a new product/program/solution to a problem based on those new insights that emerge from that data set; and (c) communicate the nature of the opportunity and how to implement it in a professional conference-like format.

Sprinkled through-out the course will be readings, guest lectures, right-brain sensory activities, and extemporaneous assignments.

Professional Development. An additional, graded component of this course will be working towards your "exit" strategy from the program, which will vary by individual. This may include developing your professional profile, your professional network, and cultivating professional opportunities to pursue upon graduation. More detail is provided below.

Course Requirements*

1.	Pre-work on data set	5%
2.	Creativity Training and Presentation	10%
3.	Class writing on readings/lectures	15%
4.	Class Leadership Day	5%
5.	Speaker due diligence	5%
6.	General Class Contribution	5%
7.	Data Privacy Analysis / Debate	10%
8.	Final Project	20%
9.	Final Project Presentation	5%
10.	Peer grading	10%
11.	Professional Development	10%

* Rapid Innovation Cycle Work   25%

* Beginning on February 27, Mario will be leading class on Monday nights for five weeks, **from 3:30-6:30 p.m**. Please make your schedule adjustments as needed. During these five weeks, usually there will be no class on Wednesdays (for example, EXCEPT if there is a speaker). These extra classes will count towards the extra 15 hours of class time for the extra 1 credit component.

Minimum Expectations: All work in this course must exhibit technical competency (from your other courses), writing competency for business executives, and competency in the innovation concepts from this course.

All your written work in this class will be submitted anonymously/by number.

A comment on peer grading (5%): As business professionals and managers, you must be skilled at both giving and receiving feedback. Peer grading is common in executive programs and in MOOCs. Mario will give some preliminary guidance on how to give and receive feedback, based on a class he is currently taking. We will develop a system for peer grading in this class. TBD.

1. Pre-work on data set (5%): Prior to being trained in a creativity protocol, each student will examine/analyze his/her data set based on technical training. Describe the data set to me, describe the analytical technique used (use a technical appendix for technical analyses); present the analysis in a user-friendly format; and document the three most notable findings in a relatively complete fashion (findings/meaning).

Due Thursday, February 2nd at 5:00 p.m. /
Peer grading due on 4 pre-work analyses, February 8, by 3:30

2. **Creativity Training & Presentation (10**%): Students will be divided into three groups for creativity & innovation; they will self-train via outside reading, and then participate in a hands-on workshop (with a professional) outside of class on one of the creativity protocols: Creative Problem Solving; Biomimicry; TRIZ.   Students will take a creativity pre-test prior to being trained in the protocol.
➢ Student teams will prepare a 15 minute presentation for their classmates (suggested outline: 5 minute overview of what the protocol is; who tends to use it for what; 5 minute overview of the process of using that protocol/steps; 5 minute on pros/cons and personal reflections)
➢ Presentations **Due February 13** in class. ORDER: CPS 1, Biomimicry, TRIZ, CPS 2
Peer feedback due on two presentations by Tuesday, the 14th at noon.

Grading criteria:
- Quality visuals
- Quality delivery (clear explanation; excellent delivery; effective time management, etc.)
- Quality insights

3. **Class writing on readings/lectures (15%):** Students will submit a bi-weekly journal of their "musings on big data and innovation," of roughly 1500 words (spacing for me of 1.5, not single spaced)....I will try to explain what I want journaled BEFORE class (assigned readings) and what I want journaled AFTER class (musings…)

Grading criteria:
- Explicit knowledge of key points/issues from the readings/lectures (may use a table or figures to demonstrate key knowledge) – don't be superficial; show insights via detail.
- Insights/implications of readings for your own data science journey (key quotes, meaning, etc.)
- Professional writing skills (clear, concise, accurate) and quality formatting.

DUE DATES: Students 1-6 due on even weeks/ Students 7-13 due on odd weeks

Peer feedback due on three students every other week

4. Class Leadership Day (5%): Students have been randomly assigned a week on which they will serve two purposes:
➢ Find and share (5 minutes) a right-brain experience (photography, music, poetry, dance, scene from a movie, experience) that emotionally moved you. WHY did it move you? Reflect on the experience.

➢ Help with class logistics—speakers, readings, peer grading system, feedback to me, etc.

5. Speaker due diligence (5%): Students will submit a one-page overview of, and three smart questions for, each speaker one week prior to the speaker (details forthcoming).

6. General Class Contribution (5%): This component will be my assessment of your engagement and contribution to the content and spirit of the class via VERBAL CONTRIBUTIONS exhibiting: knowledge of readings, quality of insights, questions asked, examples shared, etc. This is a QUALITY assessment and not quantity. It includes being respectful of your classmates' different styles of communication and needs for time to formulate/share their thoughts.

Peer feedback on four classmates:

7. Data Privacy Analysis / Debate 10%: Details on separate page.
    Due: April 5th
    In-class debate: 3-5 students/teams selected/present April 12
    Peer feedback: TBD

8. Final Project (20%).
    * Rough draft due April 10th in class. (15%)
    * Final draft due April 24th in class (5%)
    * Peer feedback: TBD

9. Final Project Presentations 5%: April 24 and 26th. 10 minutes per student.

Our class will host a type of conference (TBD) where five students will present their projects to a mix of businesses/professionals in town from Hellgate Venture Network, Montana High-Tech Business Alliance, the Data Science Alliance, and the Missoula Economic Partnership.

Student peer evaluations will determine the 5 presentations for the the conference.
Students selected will receive 5% extra credit.

10. Quality, rigor, tone, and timeliness of peer grading (10%).

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11. Professional Development (10%): Regardless of where you are in planning your "exit strategy" from this program, having an incentive to develop your future career plan is the purpose of allocating class effort to this task. Students will write a career development plan and identify three specific tasks to execute during the semester. This might include finding groups on LinkedIn and <u>participating in</u> them; identifying key individuals on LinkedIn that have the job you want and <u>reaching out to them</u>; identifying industry trade groups and resources for conferences, webinars, etc. and <u>attending them/sitting in</u>. It can include researching specific companies and positions AND contacting personnel/doing information interviews with them.
I will give you feedback on your plans/tasks prior to you executing them, so they meet my expectations. With your permission, I'd like to get John Chandler's feedback on these.
    Your plan is due by February 10th, noon.

Final execution of these plans is negotiable, based on each student's individual plan. *Please specify your own due dates and deliverables in your plan.*

John Chandler will be running class on March 8th on professional development. You may choose to modify your plan after his presentation as needed and based on his feedback.

Final Grades: Plus/Minus grading will be used for final grades on the following scale.

93 - 100% A / 90 - 92% A-
  A = Demonstrates thorough, sophisticated understanding of the subject, displays mastery of material; analysis and writing demonstrate compelling logic, critical insights, and careful attention to detail; communicates with professional/excellent oral and written communication skills.

87 - 89% B+ / 83 - 86% B/ 80-82% B-
  B = Good understanding of the material (possible occasional oversight of key facts/ issues) and/or minor issues with clear/concise written/ oral communication; lacks supporting detail/sophisticated insights.

77-79% C+ / 73-76% C/ 70-72% C-
  C = Basic/rudimentary comprehension of terms (some inaccuracies); unclear communication skills that need significant attention/improvement.

67-69% D+/ 63-66% D/ 60-62% D-
  D = Lack of knowledge/proficiency with class concepts and/or inability to communicate your degree of learning about class material.

Below 60% F = Dereliction of class responsibilities.

General: You are encouraged to discuss your work and progress with me at any time in order to cover specific problem areas, to further clarify material, or to provide you with concrete suggestions on how to improve your performance. I'm also happy to discuss course planning and career advising at your request.

Date	Topic/Article	Student Leader
Week 1 January 23/25	Course Introduction/Expectations Types of innovation; sources of innovation "Big Data Revolution" and the Analytics Gap Creativity & Big Data	
Week 2 Jan. 30/ Feb. 1	Readings/discussion: Value & Big Data Creativity training (outside of class)	Anne Hagerty
Week 3 February 6/8	Reading/discussion: Role of Company Culture & Big Data Creativity training (outside of class)	Bailey Harper
Week 4 February 13/15	Creativity training protocol reports Q&A with Tom Cullen, Data Scientist at Starbucks	Raelin Jacqueth
Week 5 /Feb20 February 22	No Class Monday (Presidents' Day) Readings/discussion: TBD What type of data scientist are you?	
Week 6 ** February 27/ March 1	Mario takes over: Rapid content innovation. More information to follow. No class Wednesday.	Lane Colyer
Week 7 ** March 6/ Wednesday 8	Rapid content innovation with Mario Wed: J. Chandler Professional Development	Tina Cummins
	Weekend class with J. Chandler – may affect time available to do coursework this weekend	
Week 8 ** March 13/ Wednesday 15	Rapid content innovation with Mario Monday: R2C group. Wednesday: Andrew Hull/Elixiter	Jessica Diehl* (Spread the speakers)
Week 9: ** March 20/22	**Spring Break**	
Week 10 ** March 27/29	Rapid content innovation with Mario No Class Wednesday	Levi Kindred
Friday, March 31st	Advisory Board Meetings/Required	
Week 11 April 3/5	Jakki back in class/Analytics for Societal Good Data Privacy Position Papers Due	Dustin Monroe

Week 12 April 10/12	Speaker: Dave McNabb, Adidas Data Privacy Presentations/Debates	Brandon Staggs
Week 13 April 17/19	Jakki In Uruguay/Mario covers Monday Wednesday: Project Day!	Jim O'Neill
Week 14 April 24/26	In-class presentations (?)	Kayla Gonzalez
Week 15 May 1/3	Open/ Chasing Ice? Course evaluations	David Brewer
Monday, May 8	**Final Exam: 3:30-5:00**	
* Sometime between April 24 and May 11, students will give final professional presentations to HVN and Montana High-Tech Business Alliance/Data Science Alliance/MEP		

(May be done in pairs or solo)

Your mission is to write a 5-page (double-spaced, 1" margins, 12 point font)) position paper exploring the data privacy controversy. I expect your analysis to be thoughtful, meaningful, and constructive.

1. Succinctly introduce the controversy and offer a statement of purpose for your paper

2. Research the controversy and its dimensions/perspectives. **You should have at least 2 citations for each dimension of the controversy**. Controversial issues involve nuance and multiple dimensions (versus a simple pro and con) and you'll need to both identify and clearly explain these dimensions.

3. Take a stance on the privacy debate and persuasively argue your position. This means providing credible support and reasoning for the position. This is NOT an opinion piece!

4. Visual support: Tables and figures. Please convey your points and perspectives both with a visual figure and a summary table. Any tables or other exhibits, as well as your references, do not count toward the page limit.

5. Works Cited (does not count in page limit).

Rough ball park, expectations: The assignment should take approximately 2-3 hours for research and another 2-3 hours to write.

Goals
1. To be conversant in the data privacy controversy from multiple angles/dimensions
2. To hone your critical thinking skills;
3. To **develop** your writing skills – a successful Position Paper must be thoroughly researched, concise and persuasive.

Due Date: Due: April 5ᵗʰ / Peer feedback due by Friday at noon.
    In-class debate: 3-5 students/teams selected/present April 12

Grading Criteria
*   How comprehensively you explain the various dimensions and perspectives of the controversy.
*   The credibility and support for your position. Do you use compelling logic and evidence in the stance you take?
*   Writing skills. Is your writing clear, organized and coherent?

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* Alternative assignment: Take a specific case of data privacy violations and analyze what happened.

The *fine print*:

Classroom Environment/Goals: In order to provide an enjoyable, provocative learning experience, this course will provide a mix of lecture, discussion, and guest speakers. Regular attendance, active learning, and participation are expected. Contributing to a quality learning environment is the job of each individual student, and *you can do so only if you are well-prepared for each class* (by having read and done the assignments in advance). My hope is to foster a challenging yet supportive environment where you can flourish and learn.

Classroom Etiquette & **Professionalism** – Professional behavior is expected at all times. Respect for your classmates is also required in order to provide the best learning environment—this includes not only respect for diversity, but also not hogging the airtime, and being respectful of students who need a bit more time to formalize and articulate their thoughts. Please: no sidebar discussions during lecture or class discussion, no newspapers or crossword puzzles, no cell phone use during class (e.g., under-the-table text messaging), no surfing the web, and no other disruptive actions (i.e. leaving abruptly during class without prior notification). If you are disruptive in class (talking, text messaging, etc.), you will be asked to leave class and any points awarded that day will be forfeited (attendance, participation, extra credit).

Academic Misconduct -- Integrity and honesty are basic expectations for behavior. It is your duty to act honestly and ethically in your coursework, and it is my duty to ensure a fair classroom environment for all students. *Cheating of any sort will not be tolerated.* Cheating, failure to follow instructions, and/or failure to follow course policies may result in a reduced grade or a failing grade.

The following message about academic integrity comes from the Provost's office: *"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.* It is the student's responsibility to be familiar the Student Conduct Code (found online at http://www.umt.edu/vpsa/policies/student_conduct.php).

Students are expected to:
- Be knowledgeable of activities that are considered academic misconduct, as defined in the UM Student Conduct Code,
- Practice academic honesty on all exams, quizzes, homework, in-class assignments, and all other activities that are part of the academic component of a course,
- Encourage other students to do the same.

If you are unsure if a behavior will be viewed as academic misconduct, please ask. *A good rule of thumb is that any credit-earning activity in a course should represent the true skills and ability of the individual person receiving the credit*. A partial list of situations that are considered academic misconduct is in the SoBA Professional Code of Conduct (found online at http://www.business.umt.edu/Soba/SoBAEthics/CodeofProfessionalConduct.aspx). If at any point a student is unsure if working with another student is permissible, that student should contact the instructor before doing so.

Please note that it is a form of academic misconduct to submit work that was also used in another course, aka *"double dipping."* **Don't do it.** If you are trying to get synergies across your classes/assignments, just ask a professor for advice. Don't try for a two-fer without approval!

I also have a history of treating any plagiarism (from the Internet or any other source) quite severely. Always cite your sources appropriately. It actually makes your work more credible.

Disability Services for Students -- Students with disabilities will receive reasonable modifications in this course. The student's responsibilities are to request the modification from me with sufficient advance notice and to be prepared to provide official verification of disability and its impact from Disability Services for Students. To respect your privacy, please speak with me during my office hours about your needs.

Common Grammar Problems:

1. Avoid (Do Not Use) "You" (second person) in any professional paper.
    Instead, use "the consumer," or "the company," or a noun for whatever referent "you" was referring to.

2. Use correct forms of possessives.   Here are two examples:
    *   its (as in "look at its hair"). (It's = it is)
    *   a company's strategy (not a companies strategy)

3. Use correct punctuation. Here are some examples:
    A semi-colon (;) is used to separate two complete sentences (each with its own noun,verb, and complete thought). "The product strategy makes sense; however, the pricing strategy seems a bit off."

    A colon (:) is used when a list is to follow: There were a variety of marketing tools used by the company: product, price, promotion, and distribution.

    Use commas to set off phrases (one at the start, and one at the end of the phrase): It was hard to tell, based on my understanding, just what she meant.

4. Eliminate sentence fragments. Each sentence should have its own noun and verb and should express a complete thought.

    Bad: "Like my dad, for example." Or "When the company reorganized."
    Good: "People, like my dad for example, would be offended by that strategy." Or "When the company reorganized, profits soared."

5. Cite appropriately the references and sources you use in writing your paper.

6. Spell-check "gotchas":
Elusive/illusive
Affect/effect
There/they're
Disperse/disburse
Illicit/elicit