USC Marshall School of Business

MOR 458: AI technology strategic management
Location HOH 114
Tuesday and Thursday, 12:00 – 1.50 PM
Tuesday, Aug 22 – Tuesday, Oct 10, 2022
2 units

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Office Hours: By appointment. Email me to set up a time, we can meet in person or on Zoom

COURSE DESCRIPTION

No matter the roles that you take in business, making decisions about responding to a new technology developed by someone else or about introducing a new technology will be integral to competing in the marketplace. This course introduces *strategic approaches to managing technology in business* – sets of choices about if and how to use new technology as a strategic business consideration. The focus on *new technologies* is essential because what matters from a competitive strategy perspective is *technological change*: technology carries the promise of making a strategic impact as long as not all businesses use the same technology.

The most recent technological wave, artificial intelligence (AI), is poised to infiltrate all industries and markets. How can frontier AI technologies add value to an organization in the short- and the long-run? How should organizations invest their resources today to best position themselves for tomorrow? Technology strategy provides the tools necessary to make such decisions.

Developing a technology strategy implies tradeoffs. Thus, the course explores the development and application of conceptual approaches that aim to balance the allocation of scarce business resources as informed by interactions between competition, patterns of technological change, and internal firm capabilities. These challenges continue to disrupt every organization and having insight into them can equip you with your own competitive advantage in the marketplace.

LEARNING OBJECTIVES
Upon successful completion of the course, students will have the knowledge and skills to:

1. Estimate how AI can impact firms' strategies – both in terms of formulation and implementation
2. Identify different features of AI and how they can be applied to businesses
3. Create strategies to manage uncertainty associated with emerging new technologies such as AI that are unproven and whose trajectory is uncertain
4. Analyze how AI technologies can potentially impact different industries and the relative competitive positions of companies in these industries.
5. Analyze how AI technologies can potentially impact different parts of a company (e.g., marketing and sales, operations).
6. Provide a thoughtful critique of others' arguments, analyses and supporting evidence.
7. Communicate your arguments coherently and persuasively.

REQUIRED MATERIALS

There are three sources of materials for this class:
1. Required Book: *Agrawal, Ajay, Joshua Gans, and Avi Goldfarb. Prediction Machines: The Simple Economics of Artificial Intelligence. Harvard Business Review Press, 2018*
2. HBS Course Pack: https://hbsp.harvard.edu/import/1070823
3. Articles on Blackboard

COURSE FORMAT AND NOTES

The course is comprised of a mixture of lecture sessions and case analysis sessions. Slides from each class will be posted on Blackboard after Class and reviewing these will be important in preparation for the final course exam. All classes will be recorded with links available for each recording being available on Blackboard. Electronic communication for this course will take place through Blackboard, including lecture notes and information about the team project, etc. Check the Blackboard course page regularly.

The Quizzes and Submission of Project Documents will be done electronically through Blackboard

GRADING POLICIES:

Assignments	*% of Overall Grade*
Class Participation	20%
Pre-class Polls	10%
In Class Discussion	10%
Individual Assignments	50%
Chat GPT Exercise	20%
Prediction Model Exercise	30%
Two in-class quizzes	30%
TOTAL	*100%*

Participation – 20%

Pre-class Polls – 10%

There will be a total of 6 pre-class polls, for full credit of 10% you will need to complete 5 of these 6 polls, so you can afford to miss one poll. Each poll is worth 2% and you get the full credit regardless of your responses. These polls will consist of 2 or 3 questions that we will discuss in class. These polls are important to complete as it helps to aid class discussion and provides a quick pulse check of where most of the class leans regarding important class topics.

These polls can be found in the Blackboard Polls Folder and must be completed by 11.59 PM PT on the day before class.

In Class Participation – 10%

Regular class participation is critical to successfully completing this course. You are expected to participate actively in each class session. You are encouraged to prepare for class with your colleagues. However, each member of the class should be fully conversant in the material. If for some reason you are not prepared, please let me know before the start of class to save us both the embarrassment of my calling on you.

Given the importance of class discussion, pre-class preparation is crucial. For cases, you should be prepared to set forth the core challenge facing the case protagonist(s), offer a critical assessment of the situation, and

lay out cogently and persuasively a course of action. For readings, you should be prepared to outline the topic that each reading addresses, describe its central points, and offer your critical analysis of them. When cases and readings are assigned for the same day, you should be able to draw links between the case and reading in your discussion.

Disruptive behaviour, including but not limited to, arriving late, entering and exiting during the class, side conversations in class and use of cell phone will lower your participation grade as it distracts from the class discussion.

Assignment questions for each session will be posted to the course page in Blackboard, typically at least a week prior to the class for which they are assigned.

It is important to appreciate that class discussion is itself a collaborative activity. Please listen carefully to one another and attempt to build on or constructively critique prior comments. An effective participant:

- Is a good listener;
- Makes points relevant to the ongoing discussion;
- Makes comments that add to our understanding of the case, topic and/or article;
- Is willing to challenge ideas that are being expressed; and
- Integrates material from a variety of sources (e.g., past classes, other courses, and their own experience) to the discussions in class.

With respect to grading I start with a base score of 7/10. Chronic absence from class will decrease this base score. Then, I will rank students in class based on the quality of comments made in class over the entire course. Top quartile will receive 10/10, 2nd quartile 9/10, 3rd Quartile 8/10 and bottom quartile 7/10.

Individual Exercise: Chat GPT Exercise – 20%

Chat GPT is becoming an important tool in the business community in order to execute a variety of tasks ranging from crafting simple emails, all the way through to undertaking basic research analyses. In this exercise you will use the freely available version of Chat GPT (3.5) to undertake a basic research exercise. You will need to document all the prompts that you use, the output produced from Chat GPT and your evaluation of the responses using an assignment template provided in the Blackboard assignments folder.

In this assignment, you will be tasked with using chat GPT to develop a strategy for using AI for college admissions that can help to ensure a diverse class of students is recruited using only a set of objective application packet responses that will be provided in the assignment template.

Initially, you will provide a broad prompt regarding what you want Chat GPT to achieve. You will then evaluate this response in terms of:
- Ease of implementation
- How well you think the diversity goal will be achieved by the AI strategy suggested

Based on this evaluation you will provide feedback to Chat GPT to improve the suggested AI strategy, again evaluate the response using the three criteria outlined above. Repeat this once more so that in total you will have entered 3 prompts (1 initial request and 2 feedback requests), received three responses and undertaken 3 evaluations. You will then reflect on how the responses from Chat GPT have improved with each iteration noting the key items that have changed each time.

Grading:
- 8/20 points accurate capture of prompt and chat GPT responses
  - 1 point dropped for any missing prompts (should be 3 in total)
  - 1 point dropped for any missing Chat GPT response (should be 3 in total)
- 6/20 points quality of evaluation of three iterations

- Must address both questions (ease of implementation/how well can reach goal) for all three iterations
- Strong reasoning for why implementation in organization will be challenging or relatively straight forward (e.g. need to invest in new system or build up employee skills)
- Strong reasoning for whether you think the idea will help achieve the diversity goal (e.g. will evaluate new criteria, will help find hidden gem students)
  - 6/20 points quality of overall reflection
    - Clearly document how the response from Chat GPT has changed per iteration
    - Outline what has improved or got worse per iteration
    - Mention what further iterations you would have liked to have done

Individual Assignment: Prediction Model Exercise – 30%

In this exercise you will get into the "nuts and bolts" of AI and its use as a predictive tool. You will develop a simple "AI-lite" model predicting the likelihood of a specific event and then apply this model on a separate data set. Full instructions and the exercise template that you need to complete will be provided on Blackboard. The broad grading breakdown is as follows:

- Full description of predictive model (10/30 points)
  - Format of model
  - Key predictive variables and statistical significance
  - Discussion of limitations of model
- Applying model to test dataset (10/30 points)
  - Evaluation of accuracy of model – proportion of Type I and Type II errors
  - Identify where model seems to breakdown
- Application of this approach to business (10/30 points)
  - Industries to which this sort of model may apply
  - Rationale for why this model may apply in these industries
  - How model could be incorporated into business processes within your selected industries

In-class quizzes – 30%

There will be two in-class quizzes that will be conducted on Blackboard that will last 40 minutes. They will take place in classes 8 (9/14) and 15 (10/10). Both quizzes will have the same format:

Part A: This consists of 10 multiple choice questions each worth 1 point. These will be randomly selected from a test-bank with over 20 questions.

Part B: This consists of 2 short answer questions each worth 10 points.

The questions will test all the course concepts and can include short case analyses, basic calculations, applications of course concepts to current news and a variety of other question types. Practice questions will be available on Blackboard. It is highly recommended that you answer these questions and review the suggested answers.

Final Course Grades

Final grades represent how you perform in the class relative to other students. The average grade for this class is expected to average around a B+. Three items are considered when assigning final grades:
1. Your average weighted score as a percentage of the available points for all assignments.
2. The overall average percentage score within the class.
3. Your ranking among all students in the class.

COURSE CALENDAR

#	Date	Session Topic and Pre-Class Reading	Assignments Due
1	Tues, 8/22	**Course introduction** No pre-class reading	
2	Thurs, 8/24	**What AI is and is not** Agrawal, Ajay, Joshua Gans, and Avi Goldfarb. "Prediction Machines: The Simple Economics of Artificial Intelligence." Harvard Business Review Press, 2018. Chapters 1, 3 and 4.	
3	Tues, 8/29	**AI and lowering the cost of Prediction** Agrawal, Ajay, Joshua Gans, and Avi Goldfarb, "Prediction Machines: The Simple Economics of Artificial Intelligence". Harvard Business Review Press, 2018. Chapter 2.	Pre-class Poll 1 (11.59 PM PT 8/28)
4	Thurs, 8/31	**AI strategic complements/substitutes – Data** Agrawal, Ajay, Joshua Gans, and Avi Goldfarb, "Prediction Machines: The Simple Economics of Artificial Intelligence". Harvard Business Review Press, 2018. Chapter 5.	
5	Tues, 9/5	**AI strategic complements/substitutes – Human Capital** Agrawal, Ajay, Joshua Gans, and Avi Goldfarb, "Prediction Machines: The Simple Economics of Artificial Intelligence," Harvard Business Review Press, 2018. Chapters 6 and 14	Pre-class Poll 2 (11.59 PM PT 9/4)
6	Thurs, 9/7	**AI, Decision Making and Strategy** Agrawal, Ajay, Joshua Gans, and Avi Goldfarb, "Prediction Machines: The Simple Economics of Artificial Intelligence," Harvard Business Review Press, 2018. Chapters 7, 8 and 9	Chat GPT Exercise Due 11.59 PM PT 9/6
7	Tues, 9/12	**Application Case:** Tailor Brands: Artificial Intelligence-Driven Branding (HBS Case 519017 Course Packet)	Pre-class Poll 3 (11.59 PM PT 9/11)
8	Thurs, 9/14	**Quiz 1: 40 minutes (at start of class)** **Practical tools for developing an AI technology strategy** Agrawal, Ajay, Joshua Gans, and Avi Goldfarb, "Prediction Machines: The Simple Economics of Artificial Intelligence." Harvard Business Review Press, 2018. Chapters 12, 13 and 15	
9	Tues, 9/19	**Application Case:** Moderna (HBS Case 621032 Course Packet)	Pre-class Poll 4 (11.59 PM PT 9/18)
10	Thurs, 9/21	**Managing AI in Organizations** Agrawal, Ajay, Joshua Gans, and Avi Goldfarb. "Prediction Machines: The Simple Economics of Artificial Intelligence." Harvard Business Review Press, 2018. Chapters 16, 17 and 18.	
11	Tues, 9/26	**Application Case:** Vodafone: Managing Advanced Technologies and Artificial Intelligence (HBS Case 318109 Course Packet)	Pre-class Poll 5 (11.59 PM PT 9/25)

#	Date	Session Topic and Pre-Class Reading	Assignments Due
12	Thurs, 9/28	**Application Case:** Evie.ai: The Rise of Artificial Intelligence, and the Future of Work (Case NTU226 Course Packet)	Pre-class Poll Class 6 (11.59 PM PT 9/27)
13	Tues, 10/3	**AI broader policy implications** Agrawal, Ajay, Joshua Gans, and Avi Goldfarb, "Prediction Machines: The Simple Economics of Artificial Intelligence." Harvard Business Review Press, 2018. Chapter 19	Prediction Model Exercise Due 11.59 PM PT 10/2
14	Thurs, 10/5	**Application Case:** Audi A8: The World's First Level 3 Autonomous Vehicle (Case W20134 Course Packet) Course Review (Preparation for Quiz 2)	
15	Tues, 10/10	Review of Prediction Model Exercise Assignment **Quiz 2: 40 minutes (at end of class)**	

Course Policies

Add/Drop Process. If you are absent three or more times prior to August 31, 2023, I may ask you to withdraw from the course by that date if you do not notify me prior to your absence. These policies maintain professionalism and ensure a system that is fair to all students.

Course Communication: Blackboard. A Blackboard website has been created for this course at blackboard.usc.edu. You should develop the habit of checking Blackboard on a regular basis. The course syllabus, PowerPoints, lecture notes, assignment information, and additional course materials will be posted on this site throughout the semester. Since e-mails sent to the class originate from the Blackboard system, it is your responsibility to ensure that my emails are forwarded to your preferred email account such as your personal Gmail account.

Communication and Entertainment Devices. Personal communication and entertainment devices such as mobile phones are to be turned off and kept off throughout the class session. Receiving or sending communication during class disrupts the learning environment and is rude to class participants. It is important that you stay engaged with the class discussion, even if you are participating remotely and through video conferencing. Videotaping faculty lectures is not permitted, due to copyright infringement regulations. Audiotaping may be permitted if approved by the professor. Use of any recorded or distributed material is reserved exclusively for the USC students registered in the class.

Class Notes Policy. Notes or recordings made by students based on a university class or lecture may only be made for purposes of individual or group study, or for other non-commercial purposes that reasonably arise from the student's membership in the class or attendance at the university. This restriction also applies to any information distributed, disseminated or in any way displayed for use in relationship to the class, whether obtained in class, via email or otherwise on the Internet, or via any other medium. Actions in violation of this policy constitute a violation of the Student Conduct Code and may subject an individual or entity to university discipline and/or legal proceedings.

No student may record any lecture, class discussion or meeting with me without my prior express written permission. I reserve all rights, including copyright, to my course syllabi, lectures, PowerPoints, prior exams, answer keys, and all supplementary course materials available to the students enrolled in my class whether posted on Blackboard or otherwise. They may not be reproduced, distributed, copied, or disseminated in any media or in any form, including but not limited to all course note-sharing websites.

Open Expression and Respect for All. An important goal of the educational experience at USC Marshall is to be exposed to and discuss diverse, thought-provoking, and sometimes controversial ideas that challenge one's beliefs. In this course we will support the values articulated in the USC Marshall "Open Expression Statement" (https://www.marshall.usc.edu/about/open-expression-statement).

Academic Integrity and Conduct. The University of Southern California is a learning community committed to developing successful scholars and researchers dedicated to the pursuit of knowledge and the dissemination of ideas. Academic misconduct, which includes any act of dishonesty in the production or submission of academic work, comprises the integrity of the person who commits the act and can impugn the perceived integrity of the entire university community. It stands in opposition to the university's mission to research, educate, and contribute productively to our community and the world.

All students are expected to submit assignments that represent their own original work, and that have been prepared specifically for the course or section for which they have been submitted. You may not submit work written by others or "recycle" work prepared for other courses without obtaining written permission from the instructor(s).

Other violations of academic integrity include, but are not limited to, cheating, plagiarism, fabrication (e.g., falsifying data), collusion, knowingly assisting others in acts of academic dishonesty, and any act that gains or is intended to gain an unfair academic advantage.

The impact of academic dishonesty is far-reaching and is considered a serious offense against the university. All incidences of academic misconduct will be reported to the Office of Academic Integrity and could result in outcomes such as failure on the assignment, failure in the course, suspension, or even expulsion from the university.

For more information about academic integrity see the student handbook or the Office of Academic Integrity's website, and university policies on Research and Scholarship Misconduct.

Please ask your instructor if you are unsure what constitutes unauthorized assistance on an exam or assignment, or what information requires citation and/or attribution.

Artificial Intelligence (AI) and ChatGPT. I expect you to use AI (e.g., ChatGPT and image generation tools) in this class as the class is on AI!

Learning to use AI is an emerging skill, and I welcome the opportunity to meet with you to provide guidance with these tools during office hours or after class. Keep in mind the following:

AI tools are permitted to help you brainstorm topics or revise work you have already written. If you provide minimum-effort prompts, you will get low-quality results. You will need to refine your prompts to get good outcomes. This will take work and is a key part of this class.

Proceed with caution when using AI tools and do not assume the information provided is accurate or trustworthy. If it gives you a number or fact, assume it is incorrect unless you either know the correct answer or can verify its accuracy with another source. You will be responsible for any errors or omissions provided by the tool. It works best for topics you understand.

AI is a tool, but one that you need to acknowledge using. Please include a paragraph at the end of any assignment that uses AI explaining how (and why) you used AI and indicate/specify the prompts you used to obtain the results and what prompts you used to get the results. Failure to do so is a violation of academic integrity policies.

Be thoughtful about when AI is useful. Consider its appropriateness for each assignment or circumstance. The use of AI tools requires attribution. You are expected to clearly attribute any material generated by the tool used.

Please ask me if you are unsure about what constitutes unauthorized assistance on an exam or assignment, or what information requires citation and/or attribution.
- Collaboration. In this class, you are expected to submit work that demonstrates your individual mastery of the course concepts.
- Group work. Unless specifically designated as a 'group project,' all assignments are expected to be completed individually.
- Computer programs. Plagiarism includes the submission of code written by, or otherwise obtained from someone else.

If found responsible for an academic violation, students may be assigned university outcomes, such as suspension or expulsion from the university, and grade penalties, such as an "F" grade on the assignment, exam, and/or in the course.

Students and Disability Accommodations. USC welcomes students with disabilities into all of the University's educational programs. The Office of Student Accessibility Services (OSAS) is responsible for the determination of appropriate accommodations for students who encounter disability-related barriers. Once a student has completed the OSAS process (registration, initial appointment, and submitted documentation) and accommodations are determined to be reasonable and appropriate, a Letter of Accommodation (LOA) will be available to generate for each course. The LOA must be given to each course instructor by the student and followed up with a discussion. This should be done as early in the semester as possible as accommodations are not retroactive. More information can be found at osas.usc.edu. You may contact OSAS at (213) 740-0776 or via email at osasfrontdesk@usc.edu.

Support Systems

Counseling and Mental Health - *(213) 740-9355 – 24/7 on call*
Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

988 Suicide and Crisis Lifeline - *988 for both calls and text messages – 24/7 on call*
The 988 Suicide and Crisis Lifeline (formerly known as the National Suicide Prevention Lifeline) provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week, across the United States. The Lifeline is comprised of a national network of over 200 local crisis centers, combining custom local care and resources with national standards and best practices. The new, shorter phone number makes it easier for people to remember and access mental health crisis services (though the previous 1 (800) 273-8255 number will continue to function indefinitely) and represents a continued commitment to those in crisis.

Relationship and Sexual Violence Prevention Services (RSVP) - *(213) 740-9355(WELL) – 24/7 on call*
Free and confidential therapy services, workshops, and training for situations related to gender- and power-based harm (including sexual assault, intimate partner violence, and stalking).

Office for Equity, Equal Opportunity, and Title IX (EEO-TIX) - *(213) 740-5086*
Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

Reporting Incidents of Bias or Harassment - *(213) 740-5086 or (213) 821-8298*
Avenue to report incidents of bias, hate crimes, and microaggressions to the Office for Equity, Equal Opportunity, and Title for appropriate investigation, supportive measures, and response.

The Office of Student Accessibility Services (OSAS) - *(213) 740-0776*
OSAS ensures equal access for students with disabilities through providing academic accommodations and auxiliary aids in accordance with federal laws and university policy.

USC Campus Support and Intervention - *(213) 740-0411*
Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

Diversity, Equity and Inclusion - *(213) 740-2101*
Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

USC Emergency - *UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call*

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

USC Department of Public Safety - *UPC: (213) 740-6000, HSC: (323) 442-1200 – 24/7 on call*
Non-emergency assistance or information.

Office of the Ombuds - *(213) 821-9556 (UPC) / (323-442-0382 (HSC)*
A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.

Occupational Therapy Faculty Practice - *(323) 442-2850 or* otfp@med.usc.edu
Confidential Lifestyle Redesign services for USC students to support health promoting habits and routines that enhance quality of life and academic performance.

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Undergraduate Program Learning Goals and Objectives (last update 12/21/17)

Learning goal 1: Our graduates will demonstrate critical thinking skills *so as to become future-oriented problem solvers, innovators and decision makers in diverse and rapidly changing business environments.*
- Students will demonstrate the ability to anticipate, identify and solve business problems. They will be able to identify and assess central problems, identify and evaluate potential solutions, and translate a chosen solution to an implementation plan that considers future contingencies
- Students will demonstrate the ability to be accurate, clear, expansive (thorough, detailed) and fair-minded in their thinking
- Students will critically analyze concepts, theories and processes by stating them in their own words, understanding key components, identifying assumptions, indicating how they are similar to and different from others and translating them to the real world
- Students will be effective at gathering, storing, and using qualitative and quantitative data and at using analytical tools and frameworks to understand and solve business problems
- Students will understand the concepts of critical thinking, entrepreneurial thinking and creative thinking as drivers of innovative ideas

Learning Goal 2: Our graduates will develop people and leadership skills to promote their effectiveness as *business managers and leaders in the 21st century's evolving work and organizational structures.*
- Students will recognize, understand and analyze the roles, responsibilities and behaviors of effective managers and leaders in diverse business contexts e.g., functionally diverse, culturally diverse, geographically diverse, etc.
- Students will understand factors that contribute to effective teamwork including how to elicit, manage and leverage diverse perspectives and competencies.
- Students will recognize, understand, and analyze the motivations and behaviors of stakeholders inside and outside organizations (e.g., teams, departments, consumers, investors, auditors)

Learning Goal 3: Our graduates will be effective communicators *to facilitate information flow in organizational, social, and intercultural contexts.*
- Students will identify and assess diverse personal and organizational communication goals and audience information needs
- Students will demonstrate an ability to gather and disseminate information and communicate it clearly, logically, and persuasively in professional contexts
- Students will understand individual and group communications patterns and dynamics in organizations and other professional contexts

Learning goal 4: Our graduates will demonstrate ethical reasoning skills, understand social, civic, and professional responsibilities *and aspire to add value to society.*
- Students will recognize ethical challenges in business situations and assess appropriate courses of action
- Students will understand professional codes of conduct

Learning goal 5: Our graduates will develop a global business perspective. They will understand how local, regional, and international markets, and economic, social and cultural issues impact business decisions *so as to anticipate new opportunities in any marketplace.*
- Students will understand that stakeholders, stakeholder interests, business environments (legal, regulatory, competitor) and business practices vary across regions of the world
- Students will understand how local, regional and global markets interact and are impacted by economic, social and cultural factors.

Learning goal 6: Our graduates will understand types of markets and key business areas and their interaction *to effectively manage different types of enterprises.*

- Students will demonstrate foundational knowledge of core business disciplines, including business analytics and business economics
- Students will understand the interrelationships between functional areas of business so as to develop a general perspective on business management
- Students will apply theories, models, and frameworks to analyze relevant markets (e.g. product, capital, commodity, factor and labor markets)
- Students will be able to use technologies (e.g., spreadsheets, databases, software) relevant to contemporary business practices