USC Marshall School of Business

MOR 458: Technology Strategy: The Case of AI
Location JFF240
Tuesday and Thursday, 12:00 – 1.50 PM
Tuesday, Aug 23 – Tuesday, Oct 11, 2022
2 units

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Office Hours: By appointment. Email me to set a time

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. Darden Course Pack: http://store.darden.virginia.edu/mor458-technology-strategy-the-case-of-ai

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 Final Exam 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%
Team Project	40%
Project Proposal	10%
Final Report and Presentation	30%
Final exam	40%
TOTAL	*100%*

Participation – 20%

Pre-class Polls – 10%

There will be a total of 12 pre-class polls, for full credit of 10% you will need to complete 10 of these 12 polls. 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 respective class folder in Blackboard and must be completed by 10 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.

Team Project – 40%

You will self-select into a group with **no more than four students** in total. In this project you will be provided with a case study that your team needs to address regarding a leading company in an industry. Part of this case study involves analyzing a large data set which is divided into two parts. The training data set will enable you to develop a predictive model. The "live" dataset will enable you to apply this model to a real dataset to predict specific issues. In developing your final project report which will consist of a single power point deck, you will need to address the following issues:

1. Provide a background analysis of the competitive intensity in the company's industry
2. Highlight how AI is currently being used in this industry
3. Indicate how the company in the case study is utilizing AI
4. Indicate the model that you derived from the data
5. Show how this model predicts specific elements of the "live" dataset
6. Discuss the implications of your model for the company's business
7. Discuss the limitations of your model and how it could be improved
8. Outline future AI opportunities for the company in the case

There will be two deliverables in this project

1. Progress report (due Tuesday Sept 13 by 11.59 PM PT)   10% of grade
    a. Discussion of how AI is being used by the company in the case study
    b. Outlines your analysis of the training dataset
    c. Describes the predictive model that you will use to analyze the "live" data
    d. Discuss potential limitations with your model

  e. This will consist of a short Powerpoint presentation of up to 10 slides
  f. It will be graded coarsely. Check Plus (10/10), Check (8.5/10), Check Minus (7/10)

2. Final Project report (due Wednesday Oct 5 by 11.59 PM PT) 30% of grade
  a. Power point presentation that addresses all the points 1-8 above (maximum 25 slides)
  b. Short in class pitch 5 minutes for presentation in class using a selection of slides from your final report
  c. This pitch will cover how AI is being used in the company, your model, results of your model, implications and limitations.
  d. As time is short you should use no more than 5 slides.
  e. The grading will be focused on four components – each graded on a Check Plus, Check, Check Minus basis:
    i. Quality of analysis: 10/30
      1. is model clearly described?
      2. are results of model clear and appropriate?
    ii. Quality of implications and limitations: 10/30
      1. Do implications of model follow clearly from model and analysis?
      2. Are the key limitations identified?
      3. Do you articulate data gaps in model?
    iii. Quality of recommendations: 5/30
      1. Do they follow from your analysis clearly and logically?
      2. Are they realistic and implementable?
      3. Do you provide a clear plan to execute them?
    iv. In class pitch   5/30
      1. Is your main message clear and compelling?
      2. Do you draw out the key points from your analysis?
      3. Do you stick time and are you concise?

Peer Evaluations. Each of you will complete a peer evaluation of the members of your team with respect to the team final project. You will complete an online survey providing feedback on your team members. This survey will be due following the final project presentations and due by 11.59 PM PST Thursday, 10/6. I will adjust your team grade up or down based on how well you contribute to your team based on the feedback of this feedback survey.

➤ **If you experience any team-related problem (e.g. conflict, free-rider), please let me know immediately. Do not wait until the end of the semester. If you report this problem too late, there is not much I can do. Please make sure to be in touch frequently with any issues.**

Final exam – 40%

A final exam will be held in the final class session on Tuesday, October 11th. If you need DSP accommodation for this class, please let me know as soon as possible after starting the class so we can make suitable arrangements.

The exam will consist of two parts and be conducted on Blackboard and will be 100 minutes in duration. The final exam is Open Book.

Part A: This consists of 15 multiple choice questions each worth 2 points. These will be randomly selected from a test-bank with over 25 questions.

Part B: This consists of 5 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 at least 3 weeks prior to the final exam. 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, 8/23	**Course introduction** No pre-class reading	
2	Thurs, 8/25	**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.	Pre-class Poll Class 2 (10 PM PT 8/24)
3	Tues, 8/30	**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 Class 3 (10 PM PT 8/29)
4	Thurs, 9/1	**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. **Application Case: Basic Data Analysis for Team Project** Darden Case Pack: Tesla and the Future of Autonomous Driving Baucells, Manel; Yemen, Gerry Case QA-0911	Pre-class Poll Class 4 (10 PM PT 8/31)
5	Tues, 9/6	**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 Class 5 (10 PM PT 9/5)
6	Thurs, 9/8	**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	Pre-class Poll Class 6 (10 PM PT 9/7)
7	Tues, 9/13	**Application Case: Implications of Autonomous Vehicles** Darden Case Pack: Driverless Trucks at Ford: Cruising into a Compromised Brand Identity? Venkatesan, Rajkumar; Craddock, Jenny Case M-0967	Pre-class Poll Class 7 (10 PM PT 9/12) Project Progress Report Due (11.59 PM PT 9/13)
8	Thurs, 9/15	**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	Pre-class Poll Class 8 (10 PM PT 9/14)
9	Tues, 9/20	**Application Case: AI and the Hotel Industry** Darden Case Pack: OYO Hotels USA: Coming to America Weiss, Elliott N.; Maiden, Stephen E. Case OM-1641	Pre-class Poll Class 9 (10 PM PT 9/19)
10	Thurs, 9/22	**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.	Pre-class Poll Class 10 (10 PM PT 9/21)

#	Date	Session Topic and Pre-Class Reading	Assignments Due
11	Tues, 9/27	**Application Case: Applying AI to a Business** Darden Case Pack: Artificial Intelligence Here and Now: Managing through Hype and Reality Korinek, Anton; Spencer, Alexander Case OM-1724	Pre-class Poll Class 11 (10 PM PT 9/26)
12	Thurs, 9/29	**Application Case: Bias in AI** Automated Hiring at Amazon Wicks, Andrew C.; Budd, Linnea P.; Moorthi, Ryan A.; Botha, Helet; Mead, Jenny Case E-0470	Pre-class Poll Class 12 (10 PM PT 9/28)
13	Tues, 10/4	**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 Acemoglu, Daron and Pascual Restrepo. 2019. "The Wrong Kind of AI? Artificial Intelligence and the Future of Labor Demand." Cambridge Journal of Regions, Economy and Society. *(Blackboard)*	Pre-class Poll Class 13 (10 PM PT 10/3)
14	Thurs, 10/6	Project 5-minute final pitches Course review to prepare for final exam	Final Project Report Due (11.59 PM PT 10/5)
15	Tues, 10/11	Final Exam in Class 100 minutes duration	

ADDITIONAL INFORMATION

Add/Drop Process

Most Marshall classes are open enrollment (R-clearance) through the Add deadline. If there is an open seat, you can add the class using Web Registration. If the class is full, you will need to continue checking Web Registration or the Schedule of Classes (classes.usc.edu) to see if a space becomes available. Students who do not attend the first two class sessions (for classes that meet twice per week) or the first class meeting (for classes that meet once per week) may be dropped from the course. There are no formal wait lists for Marshall undergraduate courses, and professors cannot add students or increase the course capacity. If all sections of the course are full, you can add your name to an interest list by contacting the Office of Undergraduate Advising & Student Affairs; if new seats or sections are added, students on the interest list will be notified.

The last day to add the class or withdraw without receiving a "W" (and receive a refund) is 9/9/2022. The last day to drop with a mark of a "W" (no refund) is 10/7/2022.

If you are absent three or more times prior to Insert date 9/9/2022, I may ask you to withdraw from the class by that date.

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.

Technology Policy
You may use your laptops or tablets during class to look at slides through zoom and take notes. 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. You may use your laptops in class to take notes, however you must pay attention to the class. If I see you browsing the web etc. you will get a cold call question.

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."

<div align="center">**Statement on Academic Conduct and Support Systems**</div>

Academic Conduct:

Plagiarism – presenting someone else's ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Part B, Section 11, "Behavior Violating University Standards" policy.usc.edu/scampus-part-b. Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on Research and Scholarship Misconduct.

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
studenthealth.usc.edu/counseling
Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

National Suicide Prevention Lifeline - 1 (800) 273-8255 – 24/7 on call
suicidepreventionlifeline.org
Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.

Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-9355(WELL), press "0" after hours – 24/7 on call
studenthealth.usc.edu/sexual-assault
Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

Office for Equity, Equal Opportunity, and Title IX (EEO-TIX) - (213) 740-5086
eeotix.usc.edu
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
usc-advocate.symplicity.com/care_report
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.usc.edu

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) 821-4710
campussupport.usc.edu
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
diversity.usc.edu
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
dps.usc.edu, emergency.usc.edu
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) 442-120 – 24/7 on call
dps.usc.edu
Non-emergency assistance or information.

Office of the Ombuds - (213) 821-9556 (UPC) / (323-442-0382 (HSC)
ombuds.usc.edu
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) 442-33*40 or otfp@med.usc.edu
chan.usc.edu/otfp
Confidential Lifestyle Redesign services for USC students to support health promoting habits and routines that enhance quality of life and academic performance.

USC Marshall

School of Business

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