

## **95-722 - Digital Transformation**

Carnegie Mellon University

Masters of Information Systems Management Program

Fall 2021, Mini 2

### **Instructor:**

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Office Hours: I have an open-door policy. For quick topics, feel free to e-mail or call; I will do my best to respond quickly. If you would like to talk in person, feel free to drop by or e-mail me to make an appointment.

### **Faculty Assistant:**

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### **Teaching Assistants:**

Section C: Shuxuan “Helen” Zeng ([shuxuanz@andrew.cmu.edu](mailto:shuxuanz@andrew.cmu.edu))

Section D: Yangfan Liang ([yangfanl@andrew.cmu.edu](mailto:yangfanl@andrew.cmu.edu))

### **Course Information:**

Section C  
TuTh 10:10-11:30

Section D  
TuTh 1:25-2:45

**Course Objectives:**

The goal of this course is to analyze and understand how technological change impacts firms, markets, supply chains, and regulatory/policy structures. Information and communication technologies play multiple roles within businesses, organizations, industries, and societies:

- From a ***technological perspective***, they define the information and communication infrastructure of the entity and they enable new ways to digitize processes.
- From a ***managerial perspective***, they facilitate new coordination and communication processes within and across entities, enable new organizational forms, change the information environment underlying the business, and permit new incentive and monitoring structures.
- From a ***policy perspective***, these new coordination and communication processes, new organizational forms, new modes of cross-organizational interaction, and new incentive and monitor structures frequently challenge established policy and regulatory structures.

Successful efforts at digitization must keep technological, managerial, and policy perspectives in mind. Using a mix of theory and case analysis, this course will study how the deployment of information technology changes interactions and processes within organizations, across organizations, within industries, and across society.

Given this environment, the course has the following key learning objectives:

- Enable students to evaluate the likely impact of future IT innovations on firms and industries.
- Identify key drivers of technology's impact on the business ecosystem.
- Formulate appropriate frameworks to categorize technological innovation and its impact along a variety of metrics including competitive environment, business model disruption, and supply chain structure.
- Develop business communication skills to effectively communicate recommendations in both written and spoken forms.

The case analyses will require students to engage in both technical and managerial problem solving. The technical component of the analysis requires students to understand IT architectures for the problems highlighted in the case. The managerial component of the analysis requires students to analyze the business value and managerial impact of IT, and to address the change management issues that arise in implementing any digital transformation initiative.

**Cheating, Plagiarism, and Academic Integrity:**

Students at CMU are engaged in preparation for professional activity of the highest standards. Each profession constrains its members with both ethical responsibilities and disciplinary limits. To assure the validity of the learning experience, Carnegie Mellon establishes clear standards for student work. You are required to be familiar with all university policies on this subject (see

<http://www.cmu.edu/policies/documents/Cheating.html>). A portion of these policies is reproduced here for emphasis:

In any presentation, creative, artistic, or research, it is the ethical responsibility of each student to identify the conceptual sources of the work submitted. Failure to do so is dishonest and is the basis for a charge of cheating or plagiarism, which is subject to disciplinary action.

Cheating includes but is not necessarily limited to:

- Plagiarism, explained below.
- Submission of work that is not the student's own for papers, assignments or exams.
- Submission or use of falsified data.
- Theft of or unauthorized access to an exam.
- Use of an alternate, stand-in or proxy during an examination.
- Use of unauthorized material including textbooks, notes or computer programs in the preparation of an assignment or during an examination.
- Supplying or communicating in any way unauthorized information to another student for the preparation of an assignment or during an examination.
- Collaboration in the preparation of an assignment. Unless specifically permitted or required by the instructor, collaboration will usually be viewed by the university as cheating. Each student, therefore, is responsible for understanding the policies of the department offering any course as they refer to the amount of help and collaboration permitted in preparation of assignments.
- Submission of the same work for credit in two courses without obtaining the permission of the instructors beforehand.

Plagiarism includes, but is not limited to, failure to indicate the source with quotation marks or footnotes where appropriate if any of the following are reproduced in the work submitted by a student:

- A phrase, written or musical.
- A graphic element.
- A proof.
- Specific language.
- An idea derived from the work, published or unpublished, of another person.

Regarding plagiarism, you should also familiarize yourself with the content of the separate handout entitled “A Note on Plagiarism and Citing Sources.”

***I also wish to inform you that I make use of plagiarism detection tools provided by the University.***

One application of this plagiarism policy for our class is that you may not receive information on case write-ups from students outside of your project team. This includes both students from prior semesters and students from other project teams in this semester.

If you believe that a classmate is engaged in an academic integrity violation, you may report that violation to me (the instructor) or any TA, or if you prefer you can anonymously report violations to Carnegie Mellon's "Ethics Reporting Hotline" at 877-700-7050 (for more information, see: [http://www.cmu.edu/hr/eos/forms/carnegie\\_mellon\\_hotline\\_poster.pdf](http://www.cmu.edu/hr/eos/forms/carnegie_mellon_hotline_poster.pdf)).

### **Course Web Site:**

Web: <https://canvas.cmu.edu/courses/26096>

We will use the Canvas for course information and announcements. If you are registered in the class you should already have access. Your login id is your andrew id and password.

If you are on the wait list, you should still be able to access the site with your Andrew login (with the exception of the student resources section). If this does not work, please e-mail the teaching assistant for your section to obtain temporary access.

The web site has an up-to-date copy of the syllabus, schedule, and any class announcements. While I will try to make announcements both in class and on the web site, it is a good idea for you to check the web site regularly. Additionally, the web site has links to class readings and relevant sites mentioned in class and more extensive background material.

### **Reading Materials:**

We will be using several cases from Harvard Business School. You can access the cases at the following links. Your student account will be charged directly for the HBS case fee:

**"Winning the Race with Ever Smarter Machines," Andrew McAfee and Erik Brynjolfsson, Sloan Management Review, Winter 2012, pp. 53-60.**

**"The Digitization of Just About Everything," Andrew McAfee and Erik Brynjolfsson, Rotman Management Magazine, Fall 2015, pp. 39-42.**

**"IT Doesn't Matter," Nicholas G. Carr, OnPoint Edition (with Letters to the Editor), HBS Product Number 3566.**

**"Investing in the IT That Makes a Competitive Difference," Andrew McAfee and Erik Brynjolfsson, Harvard Business Review, July-August 2008.**

**"Disruptive Technologies: Catching the Wave," Joseph L. Bower and Clayton Christensen. Harvard Business Review, January-February 1995.**

**“The Other Disruption,” Joshua Gans. Harvard Business Review, March 2016.**

**“The Crisis at Encyclopædia Britannica,” Shane Greenstein and Michelle Devereux. Kellogg Case Number 251.**

**“Keep Calm and Manage Disruption,” Joshua Gans. Sloan Management Review. Spring 2016.**

**BMG Entertainment, HBS Case 9-701-003.**

**Hulu: An Evil Plot to Destroy the World? HBS Case 9-510-005.**

**Why Isn’t Hulu Better? Michael D. Smith, Rahul Telang. Harvard Business Review, Digital. April 25, 2019.**

**Apple v. The FBI, Ivey Case 9B18E013.**

**It’s Time to Update Section 230. Michael D. Smith, Marshall Van Alstyne. Harvard Business Review, Digital. August 12, 2021.**

Other supplemental readings are available on Canvas or will be distributed in class.

### **Grading and Course Requirements:**

You will be evaluated on the basis of your case analyses, in-class discussions, and a policy memo.

The final grade for the course is distributed among various assignments and activities as follows:

1. Class Learning Contribution: 30%
2. Case Analysis: 50%
3. Individual Policy Memo (last week of class): 20%

**Class Learning Contribution:** The quality of our learning environment is contingent on the effective and informed participation of each class member. The goal here is not to dazzle us with your individual brilliance or with the number of comments you make, but rather to help make the class smarter. Note that, in addition to providing new insights to the discussion, it is possible to make the class smarter by asking the right question or by assimilating comments from other students or sources. It is also possible to contribute to the class by giving a short presentation related to your professional experience as it relates to the class material (such presentations should be discussed with me in advance).

In addition, I will try to close each class by asking for someone to summarize the key “takeaways” of today’s class. Answering this question well is another opportunity to contribute to our discussion.

The case analyses are designed to help you participate in an effective manner in class. The quality of your comments and your ability to build on and respond to threads in a conversation about a particular issue will be taken into account in assigning your participation grade.

It is important to note that class contribution is assessed on an individual basis. This is inherently a subjective assessment but will take the following factors into account:

- a. Preparation.
- b. Ability to coherently present arguments and to contribute to a discussion.
- c. Ability to influence and persuade others in class to agree with your opinions.

Because of the importance of contribution to both your learning and your classmates' learning, ***I am requiring you to turn off your laptops and other electronic devices (tablets, cell phones, etc.) during class and will take your compliance into account when assigning contribution grades.*** If you have a unique situation that necessitates the use of a laptop during class, please contact me beforehand.

The reason I plan to reduce contribution scores for people who persist in using electronic devices in class is that research suggests your electronics use can have a negative impact on those around you. Consider this quote from a paper titled "Laptop multitasking hinders classroom learning for both users and nearby peers":

*We found that participants who multitasked on a laptop during a lecture scored lower on a test compared to those who did not multitask, and participants who were in direct view of a multitasking peer scored lower on a test compared to those who were not. The results demonstrate that multitasking on a laptop poses a significant distraction to both users and fellow students and can be detrimental to comprehension of lecture content.<sup>1</sup>*

Case Analysis: Your case analysis grade is based on a 2-page write-up (double-spaced, 12-point font, 1 inch margins). Cases will be done in teams of 4-5 students. Team assignments will be emailed to you and available on Canvas.

Your team's case submission is ***due to Blackboard by midnight the day before the case is discussed in class.***

Your write-up should address the issues raised in the case narrative and discussion questions. I will provide a more detailed description of the case write-up expectations in a separate handout titled "Notes on Case Analysis."

Policy Memo: There will be an individual "policy memo" write-up based on the material discussed in the last week of class following the same 2-page (double-spaced, 12-point font, 1-inch margins) format as the group case analysis assignments.

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<sup>1</sup> Source: <http://www.sciencedirect.com/science/article/pii/S0360131512002254>.

**A Note on Regrade Requests:** We make every effort to return graded assignments within 1 week of their submission. If you believe that your grade is inaccurate, you may request a regrade under the following conditions:

1. Regrade requests must be submitted within 1 week of the date when the grade was returned.
2. Regrade requests must be in writing and must include a copy of the original assignment.
3. Regrade requests must outline the reasons you deserve a higher grade. These will typically be that the grader misread or misunderstood your answer, or they didn't take something into account that they should have. For this, you should use the written comments on the assignment as your reference point. Referencing another student's grade is inappropriate and irrelevant. While we do our best to apply an even standard across students, we can't discuss anyone else's grade with you, so we need to deal with the merits of your particular case.
4. I reserve the right to regrade the entire assignment and thus your grade may go up or down.
5. Class contribution grades are inherently subjective and not subject to a regrade request. I will make notes on participation at the end of each class and assign grades at the end of the semester based on these notes. I am, however, more than happy to discuss your progress in terms of class contribution at any point in the semester.

**Take care of yourself:**

Do your best to maintain a healthy lifestyle this semester by eating well, exercising, avoiding drugs and alcohol, getting enough sleep and taking some time to relax. This will help you achieve your goals and cope with stress.

All of us benefit from support during times of struggle. You are not alone. There are many helpful resources available on campus and an important part of the college experience is learning how to ask for help. Asking for support sooner rather than later is often helpful.

If you or anyone you know experiences any academic stress, difficult life events, or feelings like anxiety or depression, I strongly encourage you to seek support. I would be more than happy to talk to you about any issues you are having, either related to the class or simply related to your life here at CMU. You can also reach out to a friend, faculty or family member you trust for guidance getting connected to the support that can help, or use CMU's Counseling and Psychological Services (CaPS) (412-268-2922, <http://www.cmu.edu/counseling/>).

**Course Schedule:**

*This schedule is subject to change during the semester. All changes will be announced in class or posted to Canvas.*

*Unless otherwise announced, all assignments are due to Blackboard by midnight the night before the assignment is discussed in class. There is a 10% penalty for late assignments. No assignments are accepted after the start of the 10:10AM class on the day of discussion.*

Readings marked with (HBS) are in the reading pack available from the Harvard Business School Publishing links in this syllabus. Readings marked with (Canvas) are available on Canvas.

**October 19 — Introduction:** I will briefly review the course objectives and student expectations we will use during the mini. The objective of the course is to engage in analytical thinking regarding important information technology management issues. You will combine your knowledge of information technology, decision-making, strategy and data analysis in these case analyses and discussions. There will be no lectures *per se* in this course beyond a few professor-led discussions to provide a set of analytic frameworks. You will be tasked with preparing cases and evaluated on the quality of your participation and analysis.

**Recommended Articles**

- “How to Talk in Meetings When you Hate Talking in Meetings,” Dana Rousmaniere, Harvard Business Review, April 21, 2016. (<https://hbr.org/2016/04/how-to-talk-in-meetings-when-you-hate-talking-in-meetings>)
- “The Plagiarism Spectrum,” Turnitin.com. ([http://turnitin.com/assets/en\\_us/media/plagiarism-spectrum/](http://turnitin.com/assets/en_us/media/plagiarism-spectrum/))

**Module 1: Frameworks for Digital Transformation**

**October 21 — What is Digital Transformation:** In this class we will discuss why understanding “Digital Transformation” is important for future IT leaders, including its conceptual origins, what questions it raises for managers, and the cases and topics we will use in this class to illustrate these concepts.

**Required Articles**

- “Winning the Race with Ever Smarter Machines,” Andrew McAfee and Erik Brynjolfsson, Sloan Management Review, Winter 2012, pp. 53-60. (<https://hbsp.harvard.edu/tu/9c136370>)
- “The Digitization of Just About Everything,” Andrew McAfee and Erik Brynjolfsson, Rotman Management Magazine, Fall 2015, pp. 39-42. (<https://hbsp.harvard.edu/tu/a4b42c93>)



### ***Supporting Articles***

- “Adobe Communication,” Matt Gemmell, Blog Post. (<http://mattgimmell.com/2011/11/09/adobe-communication/>). In this post, Matt Gemmell takes a long and boring Adobe blog post written in “marketing speak” and makes it shorter, and easier to understand by writing it in “human speak.” It’s a good example of the type of honest, straightforward writing that I’m looking for.

**October 26 — IT Doesn’t Matter?:** In this class, we will debate whether IT will make it easier or harder for firms to gain competitive advantage over their rivals. There are two broad schools of thought about how IT will impact competitive strategy. The first says that investment in IT can lead to proprietary advantages to the firm that are hard for competitors to copy. The second says the exact opposite: that the very nature of IT means that investments are readily and easily available to competitors, and as such IT is a commodity input, providing strategic advantage to no one. Which side is right?

### ***Required Articles***

- “Beyond the Productivity Paradox,” Erik Brynjolfsson and Lorin Hitt, Communications of the ACM, August 1998, pp. 49-55. (Canvas)
- “IT Doesn’t Matter,” Nicholas G. Carr, OnPoint Edition (with Letters to the Editor), HBS Product Number 3566.
- “Investing in the IT That Makes a Competitive Difference,” Andrew McAfee and Erik Brynjolfsson, Harvard Business Review, July-August 2008.

### ***Supporting Articles***

- “Dog Eat Dog,” Andrew McAfee and Erik Brynjolfsson, Wall Street Journal, April 28, 2007. (<https://www.wsj.com/articles/SB117735476945179344> and Canvas)
- “Scale without Mass: Business Process Replication and Industry Dynamics,” Erik Brynjolfsson, Andrew McAfee, Michael Sorell, Feng Zhu, Working Paper, MIT Sloan School of Management (<http://ssrn.com/abstract=980568>)
- “VII Pillars of Productivity,” Erik Brynjolfsson, Optimize, May 2005. (<http://tinyurl.com/5h89bs>)
- “IT Does So Matter!” Computerworld, Kathleen Melymuka, July 7, 2003. (<http://www.computerworld.com/article/2571616/it-management/it-does-so-matter-.html>)

**Assignment:** In 2003, Nick Carr wrote an influential article in the Harvard Business Review entitled “IT Doesn’t Matter.” In this assignment, you have been asked by the CEO of your company to evaluate whether your company should adopt Nick Carr’s advice in the present timeframe. Feel free to be creative about what company you choose to “work for” as part of this exercise.

Ideally your response should use specific examples (including ones drawn from outside the assigned readings) to support your position. As you prepare your write-up, a useful thought experiment might be to imagine whether your firm would be better or worse off by following Nick Carr’s advice.

My goal in this exercise is to get us thinking about whether (and if so why) companies can gain competitive advantage from investments in IT, something that, arguably, looks like a commodity input.

**October 28 — What is Disruptive Innovation?:** In this class we will present two theories of how new technologies, particularly information technologies, can threaten established companies' dominance: demand-side and supply-side disruption. After presenting the theories, we will discuss their application in markets, and begin to discuss how firms can respond to these changes.

### ***Required Articles***

- “Disruptive Technologies: Catching the Wave,” Joseph L. Bower and Clayton Christensen. *Harvard Business Review*, January-February 1995. (<https://hbsp.harvard.edu/tu/b138db34>)
- “The Other Disruption,” Joshua Gans. *Harvard Business Review*, March 2016. (<https://hbsp.harvard.edu/tu/f9585b43>)

### ***Supporting Articles***

- “Big-Bang Disruption,” Larry Downes and Paul Nunes, March 2013. (<https://hbr.org/2013/03/big-bang-disruption>)
- “Forward to ‘7 Powers’,” Reed Hastings. (<http://7powers.com/foreword/> — pay particular attention to his discussion of “counter positioning”).
- “Quickster Is Dead: Netflix Kills DVD-Only Service Weeks After Unveiling It,” Bianca Bosker, Huffington Post, November 10, 2011. ([http://www.huffingtonpost.com/2011/10/10/qwikster-dead-netflix-kills\\_n\\_1003098.html](http://www.huffingtonpost.com/2011/10/10/qwikster-dead-netflix-kills_n_1003098.html))
- “Taking A Wait-And-See Approach With Disruptive Innovations,” Matt Marx, August 8, 2014. (<http://techcrunch.com/2014/08/08/taking-a-wait-and-see-approach-with-disruptive-innovations/>)
- “The Anatomy of Foresight Traps,” Shane Greenstein, IEEE Computer Society, May-June 2005. (Canvas & <http://www.kellogg.northwestern.edu/faculty/greenstein/images/htm/Columns/anatomy.pdf>)
- “Creative Destruction and Deconstruction,” Shane Greenstein, IEEE Computer Society. (Canvas & <http://tinyurl.com/n75sos>).

<b><i>Module 2: Digital Transformation of Firms and Industries</i></b>
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**November 2 — Structural Transformation in The Music Industry (BMG Entertainment, HBS Case 9-701-003):** One key, and in my opinion underdiscussed, aspect of disruption is how disruption changes the structure of industries. To understand how technology might change the structure of industries, it's important to analyze how economic and environmental forces shaped the existing structure of the industry.

In this class section, we'll try to do that by understanding the structure of the music industry circa 1999. The music industry is important and interesting because throughout its history, power

in the music industry has been concentrated in the hands of a 3-5 label who exercised a great deal of power over artists upstream and distribution channels downstream.

I'd like for us to first understand why power had been concentrated in the hands of a small number of labels for so long and then evaluate whether the new technologies emerging in the early 2000s are likely to change that power significantly.

### **Required Articles**

- BMG Entertainment, HBS Case 9-701-003. (<https://hbsp.harvard.edu/tu/bae39af2>)

### **Supporting Articles**

- “Are We Reaching Peak Streaming Subscriptions?,” Will Page, Billboard, October 17, 2020. (Canvas)
- “Examining COVID-19’s Impact on Britain’s Live and Recorded Music Industries,” Will Page, Billboard, June 24, 2020. (Canvas)
- “Peak Streaming: Are We There Yet?,” Will Page, Billboard, May 23, 2020. (Canvas)
- “Is the Music Copyright Business Worth More Than Ever?,” Will Page, Billboard, February 29, 2020. (Canvas)
- “Spotify Agrees to Buy Ringer and Reports Growth in Users,” *Wall Street Journal*, February 5, 2020. (<https://www.wsj.com/articles/spotify-adds-subscribers-swings-to-loss-as-it-invests-in-podcasts-11580900543> and Canvas)

**Assignment — Structural Change in the Music Industry?:** In this assignment I would like for you to imagine that it is 2000 and you’ve been asked by a record industry executive to evaluate whether digital technologies will change structure and competitive power in the music industry. By structure, I mean the number of record companies and their power and profitability in the industry.

Historically, we have seen 3-5 record companies dominate the industry. Your question is: will this change in the future? Will technology significantly change the structure of major record companies in the industry by allowing increased entry by new labels, vertical integration by upstream players (artists) or downstream players (e.g., distribution platforms like Spotify), significantly reducing the power of the dominant labels in the industry? Or will the same factors that have caused 3-5 firms to dominate the industry over the last 60 years persist over the next 5-10 years?

To prepare for making your argument, it would be helpful to read the BMG case and take some time to understand what factors in the music industry have caused a small number of large record companies to dominate the industry. What are the entry barriers for smaller players? Why do smaller players have trouble competing against the large incumbents? (To answer these questions, you may wish to focus on pages 1-10 of the case.) You should then think about whether technology will change these factors, and as a result change the structure of the industry.

### **November 4 — Responding to Disruptive Change and The Crisis at Encyclopædia**

**Britannica:** In this class we will continue our discussion of theories for how companies can

respond to disruptive change, and why it is so hard for companies to execute on these theories. We will illustrate our discussion with the experience of Encyclopædia Britannica.

### **Required Articles**

- “The Crisis at Encyclopædia Britannica,” Shane Greenstein and Michelle Devereux. Kellogg Case Number 251. (<https://hbsp.harvard.edu/tu/ad1fd135>)

### **Supporting Articles**

- “Keep Calm and Manage Disruption,” Joshua Gans. *Sloan Management Review*. Spring 2016. (<https://hbsp.harvard.edu/tu/40497ecd>)
- “Internet encyclopaedias go head to head,” *Nature*, December 14, 2005. (<https://www.nature.com/articles/438900a>)
- “Fatally Flawed, Refuting the recent study on encyclopedic accuracy by the journal *Nature*,” Encyclopædia Britannica, March 2006. ([https://corporate.britannica.com/britannica\\_nature\\_response.pdf](https://corporate.britannica.com/britannica_nature_response.pdf))
- “Britannica attacks...and we respond,” Editorial, *Nature*, March 29, 2006. (<https://www.nature.com/articles/440582b>)
- Also see *Nature*’s point-by-point response to Britannica’s concerns about their article, [https://www.nature.com/nature/britannica/eb\\_advert\\_response\\_final.pdf](https://www.nature.com/nature/britannica/eb_advert_response_final.pdf)

**November 9 — Digital Transformation in Security — Going Dark:** As the world has continued its shift into the digital, more aspects of our lives are lived through, and dependent on data and digital devices. This shift has required technology manufacturers to emphasize encryption and robust security in their evolving designs. While this pursuit of security is necessary to keep user’s critical personal information safe, criminals and terrorist organizations are using these same security technologies making it difficult and even impossible for authorities to access that data. Law enforcement agencies say that they must have the technical ability to lawfully access digital data via court order, while many technologists and privacy advocates hold that authorities should never force companies to weaken or circumvent security under any circumstance.

Our guest speaker for today’s class is Darrin E. Jones, the Executive Assistant Director of the Federal Bureau of Investigation’s Science and Technology Branch where he oversees the FBI’s Criminal Justice Information Services, Laboratory, and Operational Technology divisions.

EAD Jones is a 24-year veteran of the FBI, starting as a special agent in the Salt Lake City Field Office. In 2009, he coordinated the development and leadership of the FBI’s Regional Computer Forensics Laboratory in New Mexico. In 2013 he moved to FBI headquarters as section chief of the Operational Technology Division where he oversaw the FBI’s technical and policy approaches to electronic communication. As such, he is extremely well qualified to discuss the technical and policy questions raised by warrant-proof encryption on digital devices and the broader issues around the impact of end-to-end encryption on law enforcement operations.

### **Required Articles**

- “Apple v. The FBI,” Chris F. Kemerer and Michael D. Smith, Ivey Publishing Case 9B18E013, September 2018. (<https://hbsp.harvard.edu/tu/fe531df3>)

**Supporting Articles – San Bernardino Shooting**

- Order Compelling Apple, Inc. to Assist Agents in Search, United States District Court for the Central District of California, ED 15-0451M, February 16, 2016. (<https://assets.documentcloud.org/documents/2714005/SB-Shooter-Order-Compelling-Apple-Asst-iPhone.pdf>)
- “A Message to Our Customers,” Apple Inc., February 16<sup>th</sup> 2016. (<http://www.apple.com/customer-letter/>)
- Brief of Amici Curiae Amazon.com, Box, Cisco Systems, Dropbox, Evernote, Facebook, Google, Microsoft, Mozilla, Nest, Pinterest, Slack, Snapchat, Whatsapp and Yahoo in support of Apple, Inc., ED No. CM 16-10 (SP), March 3<sup>rd</sup>, 2016 (<https://www.documentcloud.org/documents/2746916-Amazon-Cisco-Dropbox-Evernote-Facebook-Google.html>)
- “Government Says It Got Data Off Terrorist’s iPhone Without Apple,” NBC News, March 28, 2016. (<https://www.nbcnews.com/tech/apple/fbi-doesn-t-think-it-needs-apple-s-help-unlocking-n546876>) (the article quotes our guest speaker, FBI Deputy Director David Bowdich)

**Supporting Articles – Unbreakable Encryption and Child Sex Abuse**

- “Facebook’s Encryption Makes it Harder to Detect Child Abuse,” Wired Magazine, October 25, 2019. (<https://www.wired.com/story/facebook-encryption-makes-it-harder-to-detect-child-abuse/>)
- “Encrypted messaging is becoming more popular, and child advocates are worried,” The Verge, September 13, 2019. (<https://www.theverge.com/facebook/2019/9/13/20863489/encryption-stanford-conference-facebook-ncmec-ghq>)
- “Facebook’s plan for end-to-end encryption sacrifices a lot of security for just a little bit of privacy,” Professor Hany Farid, Fox News, June 16, 2019. (<https://www.foxnews.com/opinion/hany-farid-facebook-end-to-end-encryption-security-privacy>)
- “Open Letter: Facebook’s ‘Privacy First’ Proposals,” from the Right Honorable Priti Patel (U.K. Secretary of State for the Home Department), William P. Barr (U.S. Attorney General), Kevin K. McAleenan (U.S. Secretary of Homeland Security), and The Honorable Peter Dutton (Australian Minister for Home Affairs), to Mark Zuckerberg, October 4, 2019. (<https://www.justice.gov/opa/press-release/file/1207081/download>)

**Supporting Articles – Law Enforcement and Policy**

- “Apple to Start Putting Sensitive Encryption Keys in China,” The Wall Street Journal, Robert McMillan and Tripp Mickle, February 24, 2018. (<https://www.wsj.com/articles/apple-to-start-putting-sensitive-encryption-keys-in-china-1519497574>)
- “Apple Takes a (Cautious) Stand Against Opening a Killer’s iPhone,” *New York Times*, January 14, 2020. (<https://www.nytimes.com/2020/01/14/technology/apple-iphone-pensacola-shooting.html>)
- “The Case of Bill Barr vs. Apple,” *Wall Street Journal*, Editorial Board, January 14, 2020. (<https://www.wsj.com/articles/the-case-of-bill-barr-vs-apple-11579047641>)

- “Facebook’s encryption plan is a dream for child pornographers, FBI says,” CNBC, October 4, 2019. (<https://www.cnbc.com/2019/10/04/facebook-will-be-a-dream-for-criminals-with-encryption-fbi-director.html>)
- “Smartphone Encryption and the Impact on Crime Victims,” New York District Attorney’s Office, April 18<sup>th</sup> 2016. (<https://www.manhattanda.org/wp-content/themes/dany/files/4.18.16%20Victim%20Organizations%20Presentation.pdf>)
- “FBI Director Calls Inability to Access Electronic Devices an ‘Urgent Public Safety Issue’,” Sara Castellanos, Wall Street Journal, January 9, 2018. (<https://blogs.wsj.com/cio/2018/01/09/fbi-director-calls-inability-to-access-electronic-devices-an-urgent-public-safety-issue/>)

**Assignment:** In today’s digital world data can be effectively concealed if the right encryption techniques and security procedures are used. Until now, law enforcement has maintained the ability to lawfully access evidence via court order, even in a locked safe or other secured area. With the advent of robust data security, evidence of crimes can be stored in a “digital safe” that is inaccessible to authorities.

In this assignment, I would like for your team to produce a 2-page case write-up advising Apple’s CEO Tim Cook as to whether he should comply with the district court’s order to “assist law enforcement agents in enabling the search” of the San Bernardino’s shooter’s iPhone.

In answering this question, you may wish to consider the following questions

- Is the government requesting access to a specific device vs. a “Master Key” / “backdoor” vulnerability that would impact the security of all iPhones?
- What is the precedent being set by robust encryption (for criminals)?
- What is the precedent being set if technology companies are forced to assist?
- How does this impact security/privacy and public safety (perceived or realized)?

**November 11 — Digital Transformation in Software Development: Chris O’Connell, Vice President of North American Partners and Alliances, Appian Corporation:** In this class, Chris O’Connell will talk to us about his work at Appian Corporation helping Appian’s clients implement low-code automation solutions, and how new software development and business process management technologies impact the day-to-day operations of firms.

**November 16 — “Why Does Hulu Suck?” — Organizational Transformation in the Motion Picture Industry:** The ability to develop an individual relationship with the consumer offers perhaps the greatest opportunity digital technologies have given to firms. However, this opportunity can also create some of the largest organizational challenges to firms, particularly firms like those in the entertainment industry which have established their organizational designs and incentive structures in an era long before customer data were available.

We will illustrate these opportunities and challenges in the context of the motion picture studios’ relationship with Hulu.com in July 2009.



**Required Articles**

- “Hulu: An Evil Plot to Destroy the World?” Anita Elberse; Sunil Gupta, Harvard Business School Case 9-510-005, June 29, 2010. (<https://hbsp.harvard.edu/tu/926c4616>)
- “Why Isn’t Hulu Better?” Michael D. Smith, Rahul Telang, Harvard Business Review, Digital, April 25, 2019. (HBS and <https://hbr.org/2019/04/why-isnt-hulu-better>)

**Supporting resources**

- “NBC Universal and News Corp. Announce Deal with Internet Leaders AOL, MSN, MySpace And Yahoo! To Create a Premium Online Video Site with Unprecedented Reach,” Press Release, March 22, 2007. (<https://www.businesswire.com/news/home/20070322005690/en/NBC-Universal-News-Corp.-Announce-Deal-Internet>)
- “Hulu.com Opens to Public, Offers Free Streams of Hit TV Shows, Movies and Clips from More Than 50 Providers Including FOX, NBC Universal, Metro-Goldwyn-Mayer Studios Inc. and Sony Pictures Television,” Press Release, March 12, 2008. (<https://www.businesswire.com/news/home/20080312005454/en/Hulu.com-Opens-Public-Offers-Free-Streams-Hit>)
- “Free, Legal and Online: Why Hulu Is the New Way to Watch TV,” Wired Magazine, September, 22, 2008. (<https://www.wired.com/2008/09/mf-hulu/>)

**November 18 — Digital Transformation and Higher Education:** In this class I’d like to discuss a topic near and dear to all of our hearts: Will digital transformation impact higher education, and if so, how might that change the structure of the education “market,” and how should higher education institutions respond?

**Assignment:** In today’s write-up I would like for you to analyze the future of higher education in the presence of information technology and digital disruption. Specifically, you have been asked by Dean Ramayya Krishnan to analyze whether IT will disrupt the business models of top institutions like Carnegie Mellon University’s Heinz College, and if so, how should the College respond.<sup>2</sup>

(Tepper students are welcome to address their memo to Tepper’s new dean, Isabelle Bajeux-Besnainou. I’m also perfectly happy if anyone would like to address the memo to President Jahanian and talk about the broader issues facing CMU. The main thing is to engage with the theories we’ve discussed in class and apply those theories to this extremely complicated and vitally important question.)

**Required Resources**

- “Business School, Disrupted,” New York Times, May 31, 2014. (<http://www.nytimes.com/2014/06/01/business/business-school-disrupted.html>)

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<sup>2</sup> My rationale for focusing on “top institutions” like CMU is that I think it is almost obvious that second- and third-tier institutions are in deep trouble and that Harvard, MIT, and Stanford are going to be fine. The interesting question, to me at least, is what’s going to happen to the 80 or so elite schools that aren’t Harvard, MIT, or Stanford.

- “Are Universities Going the Way of CDs and Cable TV?” The Atlantic, June 22, 2020. (<https://www.theatlantic.com/ideas/archive/2020/06/university-like-cd-streaming-age/613291/>)
- Browse [Outlier.org](https://www.outlier.org/)’s site, and watch the trailer (yes trailer!) for their calculus class (<https://www.youtube.com/watch?v=5YfHYhmxdYA>, particularly the 1:16 mark where Professor Hannah Fry says “there is no reason why everyone shouldn’t have access to the very best education”).
- “The Unjust University,” Chapter 1 of *The Abundant University*, Michael D. Smith (MIT Press, 2022). (draft chapter to be provided on Canvas).

### ***Supporting Articles***

- “6 Reasons Why Higher Education Needs to Be Disrupted,” Tomas Chamorro-Premuzic and Becky Frankiewicz, Harvard Business Review, November 19, 2019. (<https://hbr.org/2019/11/6-reasons-why-higher-education-needs-to-be-disrupted>)
- “Six Forces Disrupting Higher Education,” Aaron M. Renn, Manhattan Institute, June 6, 2018. (<https://www.manhattan-institute.org/html/6-forces-disrupting-higher-education-11273.html>)
- “Why Higher Education Will Change,” Steve Mintz, Inside Higher Ed, October 3, 2019. (<https://www.insidehighered.com/blogs/higher-ed-gamma/why-higher-education-will-change>)
- “Harvard Business School professor: Half of American colleges will be bankrupt in 10 to 15 years,” Abigail Hess, CNBC, November 15, 2017. (<https://www.cnbc.com/2017/11/15/hbs-professor-half-of-us-colleges-will-be-bankrupt-in-10-to-15-years.html>)
- “Do Free Business-School Courses Have a Payoff?” Kelsey Gee, Wall Street Journal, September 6, 2017. (<https://www.wsj.com/articles/do-free-business-school-courses-have-a-payoff-1504690200>)
- “Harvard Business School and the Online Threat,” Joshua Gans, June 4, 2014. (<https://digitopoly.org/2014/06/04/harvard-business-school-and-the-online-threat/>)

### ***Supporting Articles: Higher Education (Probably) Will Be Disrupted***

- “Covid-19 Accelerates 3 Disruptive Trends Facing Higher Education,” Scott Pulsipher, Forbes, Jul 8, 2020. (<https://www.forbes.com/sites/scottpulsipher/2020/07/08/covid-19-accelerates-3-disruptive-trends-facing-higher-education/#60db325a38df>)
- “This Will Be The Biggest Disruption In Higher Education,” Brandon Busteed, Forbes, April 30, 2019. (<https://www.forbes.com/sites/brandonbusteed/2019/04/30/this-will-be-the-biggest-disruption-in-higher-education/#4e714099608a>)
- “Higher Education Was Already Ripe For Disruption—then, COVID-19 happened,” Scott Barsotti, Phys.org, September 15, 2020. (<https://phys.org/news/2020-09-higher-ripe-disruptionthen-covid-.html>)
- “The Coming Disruption Scott Galloway Predicts a Handful of Elite Cyborg Universities Will Soon Monopolize Higher Education,” James D. Walsh, New York Magazine, May 11, 2020. (<https://nymag.com/intelligencer/2020/05/scott-galloway-future-of-college.html>)
- “Will Big Brands Disrupt Higher Education?” Daniel Pianko and Carol D’Amico, Tech Crunch, August 28, 2018. (<https://techcrunch.com/2018/08/28/will-big-brands-disrupt-higher-education/>)



- “The Crisis in Higher Education,” Nicholas Carr, MIT Technology Review, September 27, 2012. (<http://www.technologyreview.com/featuredstory/429376/the-crisis-in-higher-education/>)
- “Uber Would Like To Buy Your Robotics Department, Clive Thompson, New York Times, September 13, 2015. (<https://www.nytimes.com/2015/09/13/magazine/uber-would-like-to-buy-your-robotics-department.html>)
- “Udacity Says It Can Teach Tech Skills to Millions, and Fast,” Farhad Manjoo, New York Times, September 16, 2015. (<https://www.nytimes.com/2015/09/17/technology/udacity-says-it-can-...ns.html>)

### ***Supporting Articles: Higher Education (Probably) Will Not Be Disrupted***

- “Disrupting the Disruptors: Why Traditional Higher Education Isn’t Dead Yet,” Paul Freedman, RealClear Education, June 14, 2019. ([https://www.realcleareducation.com/articles/2019/06/14/disrupting\\_the\\_disruptors\\_why\\_traditional\\_higher\\_education\\_isnt\\_dead\\_yet\\_110334.html](https://www.realcleareducation.com/articles/2019/06/14/disrupting_the_disruptors_why_traditional_higher_education_isnt_dead_yet_110334.html))
- “After the Virus, Universities Will Survive,” Michael Munger, American Institute for Economic Research, April 28, 2020. (<https://www.aier.org/article/after-the-virus-universities-will-survive/>)
- “Taking It to the Streets: Preparing for an Academy in Exile,” Johann N. Neem, Association of American Colleges & Universities, Fall 2014, Vol. 100, No. 4. (<https://www.aacu.org/liberaleducation/2014/fall/neem>)
- “The Future of Higher Education: A Conversation with Lawrence Bacow, President of Harvard University,” Richard V. Reeves, Brookings, March 1, 2019. (<https://www.brookings.edu/blog/up-front/2019/03/01/the-future-of-higher-education-a-conversation-with-lawrence-bacow-president-of-harvard-university/>)
- “The Innovator’s Dilemma Hits Higher Ed,” Alana Dunagan, Wall Street Journal, May 15, 2017. (Canvas)
- “Technology Has Its Place: Behind a Caring Teacher,” Darryl Tippens, The Chronicle of Higher Education, August 6, 2012. (<http://chronicle.com/article/Technology-Has-Its-Place-/133329/>)
- “MOOC enrollment drops at HarvardX and MITx after free certifications disappear,” Techcrunch, January 13, 2017. (<https://techcrunch.com/2017/01/13/mooc-enrollment-drops-at-harvardx-and-mitx-after-free-certifications-disappear/>)
- “Why MOOCs Won’t Revolutionize Higher Ed,” Valerie Strauss, The Washington Post, July 8, 2013. (<https://www.washingtonpost.com/news/answer-sheet/wp/2013/07/08/why-moocs-wont-revolutionize-higher-ed/>)

**November 23 — Digital Transformation in Health Care — Guest Lecture: Oscar Marroquin, M.D.:** Dr. Marroquin is the Chief Clinical Analytics Officer at UPMC Health Services. In this guest lecture he will talk to us about how data and data analytics are changing the health care industry.

To accommodate Dr. Marroquin’s schedule, this lecture will be held from 11:50-1:10 in A301 instead of at our usual class times.

**November 25 — Thanksgiving: No Class*****Module 3: Digital Transformation of Society and Policy***

**November 30 — Guest Lecture: Rick Lane:** Rick Lane is the founder and CEO of Iggy Ventures, LLC. Iggy Ventures focuses on advising and investing in startups, projects, and public policy initiatives that can have a positive societal impact. Rick served from 2001–2016 as the Senior Vice President of Government Affairs for News Corporation/21st Century Fox where he was responsible for coordinating the development and implementation of the Company’s public policy activities with a focus on digital distribution. Before joining Fox, Rick was the Director of Congressional Affairs focusing on e-Commerce and Internet public policy issues for the United States Chamber of Commerce. Prior to working at the Chamber, Rick was employed by the law firm of Weil, Gotshal & Manges LLP as the Director of Legislative Affairs. While at Weil, he advised and represented clients before Congress on a variety of legislative matters affecting the technology and telecommunications industries.

In today’s class Rick will talk to us about what lobbyists do and his experience as a lobbyist moving important legislation through Congress.

**December 2: DT and Regulation:** In this last class I’d like for us to consider an important and timely topic at the interface between technology and policy: What policies should governments put in place to enable online platforms to facilitate socially beneficial exchanges of information while ensuring these platforms have sufficient incentives to prevent socially harmful exchanges of information.

We will analyze this question in the context of an ongoing debate in the United States related to Section 230 of the Communications Decency Act of 1996. CDA 230 has been called the “26 words that created the Internet.” However, CDA 230 has also come under increasing criticism by both Democrats and Republicans, and several bi-partisan bills have been introduced to reform it.

***Policy Memo - Should the Communications Decency Act Section 230 be repealed, reformed, or left as is?:*** Members of Congress will be asking their legislative staff to brief them on this issue. In this (individual) assignment you will take on the role of a Legislative Director for a Member of Congress. Your assignment is to draft a memo that makes a recommendation as to what position your Member of Congress should take on this issue.

This memo is individual work. Your memo should follow the format we have used throughout the class: Two pages, double-spaced, 12-point font, 1-inch margins. ***The write-up is due to Canvas by 11:59PM on Thursday December 1.***

**Supporting Articles:** Below I provide a list of resources that provide general background on CDA230 and resources highlighting both the value it provides and the harms it causes.

### ***Background***

- “It’s Time to Update Section 230,” Michael D. Smith and Marshall Van Alstyne, Harvard Business Review, Digital, August 12, 2021. HBS and <https://hbr.org/2021/08/its-time-to-update-section-230>
- “Now It’s Harvard Business Review Getting Section 230 Very, Very Wrong,” Mike Masnick, August 13, 2021. <https://www.techdirt.com/articles/20210812/16294647350/now-harvard-business-review-getting-section-230-very-very-wrong.shtml>

### ***The Value of CDA 230***

- “Justice Thomas Garbles Section 230 in Unwarranted Judicial Commentary,” October 13, 2020. (<https://techfreedom.org/justice-thomas-garbles-section-230-in-unwarranted-judicial-commentary/>)
- Electronic Frontier Foundation: “CDA 230 – The Most Important Law Protecting Internet Speech” (<https://www.eff.org/issues/cda230>)

### ***The Harm from CDA 230***

- “The Social Dimemma,” Netflix (<https://www.netflix.com/watch/81254224>)
- House Committee on Energy and Commerce, Testimony of Tim Kendall, September 24, 2020. ([https://energycommerce.house.gov/sites/democrats.energycommerce.house.gov/files/documents/09.24.20%20CPC%20Witness%20Testimony\\_Kendall-UPDATED.pdf](https://energycommerce.house.gov/sites/democrats.energycommerce.house.gov/files/documents/09.24.20%20CPC%20Witness%20Testimony_Kendall-UPDATED.pdf))