Synopsis
Rapid advances in disruptive technologies over the last two decades have significantly altered our lives. They have upended old business models, disintermediated incumbent firms in many industries, disrupted traditional supply chains and created new ones, and challenged traditional policy and regulatory approaches in many government domains. We can expect the pace of change in disruptive technologies and the impacts on the economy and society to increase in the years ahead, and for these advances to be felt widely across the economy, society, and government. What is commonly referred to as the “fourth industrial revolution”—a revolution powered by increasing computing power, big data and data analytics, the internet of things, artificial intelligence and robotics, and blockchain technologies—is likely to produce profound, far-reaching changes in our lifetimes.

Advances in disruptive technologies, and the disruptive business models that they create, often necessitate policy, regulatory and legislative responses by governments. They may also disrupt jobs and labor markets and increase socioeconomic inequality. Meanwhile, the rise of the “gig economy” raises questions of how social security should be financed and organized. While advances in computing power and digital technologies are likely to raise (labor) productivity significantly, the benefits could be highly concentrated—generating higher inequality as these technologies spread and more industries take on “winner-take-all” characteristics. And even if these new digital technologies create more jobs than they destroy, there would still be the issues of labor mobility and social inclusion that governments must deal with.

While governments clearly must respond to these technology disruptions, there is with no guarantee that they will do so in ways that promote early adoption of new technologies, digital innovation and entrepreneurship, and inclusive growth. This module gives students a broad introduction to the key disruptive technologies that are likely to transform our economy and society in the next decade or so. We will examine the practical applications of these technologies and discuss their policy implications and socioeconomic impacts. We will also look at the potential for governments to leverage new digital technologies to deliver new services or improve existing ones to enhance public value. Above all, we will examine the implications for public policy and how government should respond.

In particular, we will examine four distinct roles of government: as a user of these technologies; as a promoter of these technologies; as a regulator to bolster public trust and confidence in these technologies and how they are deployed; and as a social leveler to ensure that the benefits of these technologies are widely shared.

Instructors
Professor Donald Low
Professor Masaru Yarime
Professor Xun Wu
Learning Outcomes

In this course, students can expect to:

1. Gain a broad understanding of key disruptive technologies, their potential applications in business and government, and the attendant policy implications;
2. Anticipate how their operating environment might change as a result of technology disruptions, and reflected on the policy or regulatory responses that would be required of governments; and
3. Develop a sound understanding of the various roles of the state in dealing with technology disruptions, and the policy options corresponding to each of these roles.

Assessment

<table>
<thead>
<tr>
<th>Assessment Task</th>
<th>Proportion of Final Grade (%)</th>
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<tbody>
<tr>
<td>Assignments</td>
<td>80%</td>
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<tr>
<td>- Op-ed (20%) – <em>due on 8 April 12:00 pm</em></td>
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<td>- Policy brief (20%) — due on 29 April</td>
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<tr>
<td>- Comparative study: group project (40%) — due on 24 May</td>
<td></td>
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<tr>
<td>Class participation</td>
<td>20%</td>
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</tbody>
</table>
Course Outline

Lecture #1 (8 February) Introduction: Opportunities and Challenges with Disruptive Technologies (Donald Low, Masaru Yarime, and Xun Wu)

Videos to watch before the class:
https://www.ted.com/talks/keller_rinaudo_how_we_re_using_drones_to_deliver_blood_and_save_lives
https://www.ted.com/talks/jennifer_pahlka_coding_a_better_government
https://www.ted.com/talks/stefaan_verhulst_using_corporate_data_to_improve_our_lives

Readings:

Lecture #2 (15 February): Big Data and its Policy Applications, Implications and Paradoxes (Donald Low)

Videos to watch before the class:
https://www.youtube.com/watch?v=J7B9xvzawmY
https://hbr.org/video/2226808799001/disruptive-innovation-explained
https://www.youtube.com/watch?v=2NhMldHjnuM
https://www.ted.com/talks/maurice_conti_the_incredible_inventions_of_intuitive_ai
https://www.ted.com/talks/scott_galloway_how_amazon_apple_facebook_and_google_manipulate_our_emotions

Readings:
- The Economist, “Are data more like oil or sunlight?”, 20 Feb 2020
- Freakonomics podcast, “Is the Government More Entrepreneurial Than You Think?”, 5 Sep 2018 (http://freakonomics.com/podcast/mariana-mazzucato/?fbclid=IwAR3QwsK-G5NBiO7DpOU7t(MgPAXy4ShZsDH3Bn2iLxcQZiz5zrtFtuvwEXp0)

Lecture #3 (22 February): Artificial Intelligence and the Future of Jobs (Donald Low)

Videos to watch before the class:
https://www.ted.com/talks/keller_rinaudo_how_we_re_using_drones_to_deliver_blood_and_save_lives
https://www.ted.com/talks/jennifer_pahlka_coding_a_better_government
https://www.ted.com/talks/stefaan_verhulst_using_corporate_data_to_improve_our_lives

Readings:
• Financial Times, “Robots will not be coming for our jobs just yet”, 3 Jan 2020

Lecture #4 (1 March) Value Conflicts with Disruptive Technologies: Uber, DiDi, AirBnb and Digital Platform Economy (Xun Wu)

Videos to watch before the class:
https://www.ted.com/talks/rachel_botsman_the_currency_of_the_new_economy_is_trust
https://www.ted.com/talks/joe_gebbia_how_airbnb_designs_for_trust
https://www.youtube.com/watch?v=hzmjnafaro0k
https://www.ted.com/talks/amane_dannouni_how_online_marketplaces_can_help_local_economies_not_hurt_them

Readings:
• PwC: Share Economy 2017 – The New Business Model
• Slee, Tom (2017). What's yours is mine: Against the sharing economy, Chapter 3-4

Lecture #5 (8 March) Ethical Dilemma for Disruptive Technologies: Synthetic Biology and CRISPR (Xun Wu)

Videos to watch before the class:
https://www.youtube.com/watch?v=jAhjPd4uNFY&t=202s
https://www.ted.com/talks/jennifer_doudna_how_crispr_lets_us_edit_our_dna
https://www.ted.com/talks/paul_root_wolpe_it_s_time_to_question_bio_engineering
https://www.ted.com/talks/paul_knoepfler_the_ethical_dilemma_of_designer_babies

Readings:

Lecture #6 (15 March) Harnessing the Power of Disruptive Technologies in Government: Potential and Trade-offs (Xun Wu)

Readings:
• Deloitte (2012). Public sector, disrupted How disruptive innovation can help government achieve more for less.
• Thierer, Adam, Andrea Castillo O’Sullivan, and Raymond Russell (2019). Artificial Intelligence and Public Policy. Mercatus Center, Georgetown University
• Desouza, Kevin (2014). Realizing the Promise of Big Data. Implementing Big Data Projects. IBM Center for The Business of Government

Lecture #7 (22 March) Regulatory Approaches to Disruptive Technologies and Innovation (Masaru Yarime)

Video to watch before the class:
https://www.youtube.com/watch?v=WR6uSXW-8p4&feature=youtu.be

Readings:
• Regulatory Horizons Council (2021). “The Future of Technological Innovations and the Role of Regulation,” The Regulatory Horizons Council (RHC), United Kingdom, July.

Lecture #8 (29 March): Would Fintech make the world a better place? (Donald Low)

Videos to watch before the class:
https://www.ted.com/talks/don_tapscott_how_the_blockchain_is_changing_money_and_business
https://www.youtube.com/watch?v=bBC-nXj3Ng4

Readings:
• Financial Times, “A pound of flesh for your Libra Inclusion”, 24 Jun 2019
• Gita Gopinath, “Digital currencies will not displace the dominant dollar”, Financial Times, 7 Jan 2020

Lecture #9 (12 April): Internet of Things (IoT) and Cloud Computing (Masaru Yarime)

Videos to watch before the class:
https://www.youtube.com/watch?v=QSIPNhOiMoE
https://www.youtube.com/watch?v=mzy84Vb_Gxk
https://www.youtube.com/watch?v=pGtnC1jKpMg
Readings:


Lecture #10 (19 April): Smart Cities and Data Governance (Masaru Yarime)

Readings:

- Tang, Winnie (2021). Smart City 4.0. Esri China (Hong Kong).

Lecture #11 (26 April) Global Political Economy of Disruptive Technologies (Donald Low and Xun Wu)

Readings:

Handbook of Contemporary International Political Economy. (pp. 615-631). Palgrave Macmillan: London, UK

Student Presentations (3 May and 10 May)