PPOL 5380: Technology Disruptions and Public Policy, Spring 2023-2024
20 February 2024

Time and Venue:
Tuesday, 18:30-21:20
Venue: Room 2303 (Lift 17-18)

Instructor:
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Course Description
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 about 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 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 socio-economic 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.

Learning Outcomes

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

Assessment

- Class Participation: 20%
- Draft paper: 30%
- Final policy analysis paper: 50%

Class participation is an important part of the course. Students are expected to lead discussions and participate actively in class. Class participation is evaluated on the basis of the quality of contributions and critical and creative approaches to the topic of discussion.

A draft paper of about 2,000 words is expected to cover an abstract, table of contents, introduction, analysis, conclusions, and references. The draft paper would include four broad sections: (1) a description of the issue or challenge posed by an emerging technology; (2) a theoretical framework to analyze the issue or challenge; (3) analysis with empirical cases and information; and (4) identification of measures for policy intervention.

A final policy analysis paper of about 5,000 words is expected to include all the contents of the paper, including an abstract, table of contents, introduction, analysis, conclusions, and references. The policy analysis paper will be developed in stages involving topic identification, an outline of the paper, a draft, and a final paper. The policy analysis paper is expected to make policy recommendations for action regarding the issue or challenge identified.

Course Outline

Class 1 – 6 February 2024
Introduction to Disruptive Technologies and Public Policy

Readings

- Editorial, “Tools such as ChatGPT threaten transparent science; here are our ground rules for their use,” Nature, 613 (January 24), 612 (2023). https://www.nature.com/articles/d41586-023-00191-1
**Class 2 – 20 February 2024**  
Data-Driven Society and Data Governance  
(Guest Lecturer: Professor Noboru Koshizuka, The University of Tokyo)

Readings:
- The Economist, “Are data more like oil or sunlight?” *The Economist*, February 20 (2020).
- Hardinges, Jack, Peter Wells, Alex Blandford, Jeni Tennison, and Anna Scott, “Data trusts: lessons from three pilots,” Open Data Institute, United Kingdom, April (2019).

**Class 3 – 27 February 2024**  
Risks of Disruptive Technologies  
(Guest Lecturer: Professor Kira Matus, Division of Public Policy, The Hong Kong University of Science and Technology)

Readings:

**Class 4 – 5 March 2024**  
Regulation and Governance of Emerging Technologies

Readings:
• Secretary of State for Digital, Culture, Media and Sport, “Establishing a pro-innovation approach to regulating AI,” Policy paper, Government of the United Kingdom, July 20 (2022).

Class 5 – 12 March 2024
Synthetic Biology and Gene Editing
(Guest Lecturer: Professor King Chow, Division of Life Science, The Hong Kong University of Science and Technology)

Readings:

Class 6 – 19 March 2024
Smart Cities
(Guest Lecturer: Professor Kris Hartley, Department of Public and International Affairs, City University of Hong Kong)

Readings:
• Google (2019): *Collaborating For A Smarter Hong Kong Today: Smart Digital City 3.0.*
• Tang, Winnie (2021). Smart City 4.0. Esri China (Hong Kong).
• Ayona Datta, “The digital turn in postcolonial urbanism: Smart citizenship in the making of India’s 100 smart cities,” Transactions of the Institute of British Geographers, 43, 405-419 (2018).

Class 7 – 26 March 2023
Ethics and Governance of Artificial Intelligence
(Guest Lecturers: Linus Ta-Lun Huang, Research Assistant Professor, Division of Humanities & Centre for AI Research, The Hong Kong University of Science and Technology
Gleb Papyshev, Research Assistant Professor, Division of Social Science, The Hong Kong University of Science and Technology)

Readings:

Class 8 – 9 April 2024
Blockchain
(Guest Lecturer: Dr. Yushi Chen, Climate FinTech Distinguished Specialist, New Energy Nexus, Shanghai)

Class 9 – 16 April 2024
Global Political Economy of Emerging Technologies

Readings:
• Alex Engler, “The EU AI Act will have global impact, but a limited Brussels Effect,” Report, Brookings Institution, June 8 (2022).

**Class 10 – 23 April 2024**
**Digital Twins**
(Guest Lecturer: Dr. Masahiko Haraguchi, Postdoctoral Research Fellow, Global Health and Population, Harvard T.H. Chan School of Public Health)

**Class 11 – 30 April 2024**
**Internet of Things (IoT)**
(Guest Lecturer: Professor Irina Brass, Department of Science, Technology, Engineering and Public Policy, University College London)

Readings:
• Schneier, B. 2020. Securing A World of Physically Capable Computers. Live Lecture at CERN. Available at: [https://cds.cern.ch/record/2746305](https://cds.cern.ch/record/2746305)

**Class 12 – 7 May 2024**
**Opportunities and Challenges in the Governance of Emerging Technologies**
Readings:
• Indermit Gill (2020), “Whoever leads in artificial intelligence in 2030 will rule the world until 2030”, Brookings Future Development blog. ([https://www.brookings.edu/blog/future-development/2020/01/17/whoever-leads-in-artificial-intelligence-in-2030-will-rule-the-world-until-2100/?fbclid=IwAR2iPLPNFACe8joxzJ6rAlflWVUwmhZ5xQ-eFxIJDKweSOGYs03BCx2v8hE](https://www.brookings.edu/blog/future-development/2020/01/17/whoever-leads-in-artificial-intelligence-in-2030-will-rule-the-world-until-2100/?fbclid=IwAR2iPLPNFACe8joxzJ6rAlflWVUwmhZ5xQ-eFxIJDKweSOGYs03BCx2v8hE))
• George S. Yip (2018), “China’s Next Strategic Advantage: From Imitation to Innovation”. ([https://www.youtube.com/watch?v=NRqEPGOCeEf](https://www.youtube.com/watch?v=NRqEPGOCeEf))