



*Study Guide*  
**Centre for University Core**

# **SCO103**

## **New Empires: The Reach and Frontiers of the Tech Sector**





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# Course Guide

## **New Empires: The Reach and Frontiers of the Tech Sector**

## 1. Welcome



*Presenter: Dr Benjamin Choo*



This streaming video requires Internet connection. Access it via Wi-Fi to avoid incurring data charges on your personal mobile plan.

Click [here](#) to watch the video.<sup>i</sup>

Welcome to the course *SCO103 New Empires: The Reach and Frontiers of the Tech Sector*, a 2.5 credit unit (CU) course.

This Study Guide will be your personal learning resource to take you through the course learning journey. The guide is divided into two main sections – the Course Guide and Study Units.

The Course Guide describes the structure for the entire course and provides you with an overview of the Study Units. It serves as a roadmap of the different learning components within the course. This Course Guide contains important information regarding the course learning outcomes, learning materials and resources, assessment breakdown and additional course information.

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<sup>i</sup> [https://d2jifwt31jehd.cloudfront.net/SCO103/IntroVideo/SCO103\\_Intro\\_Video.mp4](https://d2jifwt31jehd.cloudfront.net/SCO103/IntroVideo/SCO103_Intro_Video.mp4)

## 2. Course Description and Aims

The disruptive impact of the rise of the tech giants will shape and influence society, the economy, and political trends for the foreseeable future. This course will equip students with the skills and the knowledge to become informed participants in the debates on managing the social, economic, and political impact of the rise of the tech giants. It will examine the threat of tech monopoly power, the role of the state in promoting and shaping the growth and development of the tech sector, and the impact of the tech sector on social stability and the authority and legitimacy of state institutions. None of the debates on these issues have been definitively concluded. Do the tech giants qualify as monopolies? If they do, what are the appropriate strategies for curbing their power? Should the state play a major role in promoting and regulating the growth and development of the tech sector? Will the products, services, and platforms provided by the tech giants exacerbate inequality and undermine the public's trust in state institutions? This course, whose main case studies are the US and Chinese tech giants, will help students to formulate their own answers to these questions.

### Course Structure

This course is a 2.5-credit unit course presented over 3 weeks.

There are three Study Units in this course. The following provides an overview of each Study Unit.

#### **Study Unit 1 – Tech Monopolies**

This unit focuses on tech monopoly power. Are the tech giants harmful monopolies? If they are, what are the appropriate actions that governments should take to curb their monopoly power? Please note that there are 2 chapters in Study Unit 1: (1) The Rise of the Tech Giants (2) Confronting Tech Monopoly Power.

## **Study Unit 2 – The Role of the State**

This unit focuses on the role of the state in shaping and promoting the growth and development of the tech sector. It discusses how and why the Chinese government intervenes in its tech sector. In addition, it will show that the United States, in spite of its free market credentials, also intervenes in its economy to promote the growth and development of its tech sector. You will learn that the United States has operated a highly successful industrial policy for several decades. Please note that there are 2 chapters in Study Unit 2: (1) The State and the Tech Sector (China) (2) The State and the Tech Sector (the United States).

## **Study Unit 3 – The Social and Political Impact of the Rise of the Tech Giants**

This unit examines the social and political impact of the rise of the tech giants. It examines how the products, services, and platforms offered by the tech giants may worsen inequality and produce social instability. It also examines the impact of these products, services, and platforms on the American and Chinese state and political institutions. Please note that there are 2 chapters in Study Unit 3: (1) Social stability in the Age of the Tech Giants and (2) State Institutions in the Age of the Tech Giants.

## 3. Learning Outcomes

### **Knowledge & Understanding (Theory Component)**

By the end of this course, you should be able to:

1. Explain how the products, platforms, and services provided by the tech giants give them immense influence and power over society.
2. Define the role of the state in promoting and shaping the growth and development of the tech sector in the United States and China.
3. Examine how the products, platforms, and services provided by the tech giants strengthen/weaken social stability and the authority/legitimacy of state institutions.

### **Key Skills (Practical Component)**

By the end of this course, you should be able to:

1. Develop arguments for and against curbing and regulating tech monopolies.
2. Illustrate the arguments for and against state intervention in and regulation of the development of the tech sector.
3. Discuss the appropriate strategies for addressing the negative impact of the rise of the tech giants on social stability and the authority/legitimacy of state institutions.

## 4. Learning Material

The learning materials to complete this course are optional online resources and are indicated in the Reference sections of the Study Guide.

## 5. Assessment Overview

The overall assessment weighting for this course is as follows:

Assessment	Description	Weight Allocation
Overall continuous assessment	Pre-Course Quiz	10%
	Progress Report	30%
	Group-based Assignment 1 (short written piece)	30%
	Group-based Assignment 2 (infographic and class presentation)	30%
<b>TOTAL</b>		100%

The following section provides important information regarding Assessments.

### Continuous Assessment:

There will be continuous assessment in the form of a computer-marked pre-course quiz, a progress report, and two group-based assignments. In total, this continuous assessment will constitute 100 percent of overall student assessment for this course. The four assignments are compulsory and are non-substitutable. These assignments will test your ability to identify, evaluate and produce arguments.

Please note that all OCAS components (i.e. your assignments) are compulsory. Students who fail to submit any OCAS component will be given a 'withdrawal' grade immediately. Students who fail to participate in assessed group assignments (e.g. presentation, debate, discussion) will also be given a 'withdrawal' grade.

**Passing Mark:**

To successfully pass the course, you must obtain a minimum passing mark of 40 percent average for the four Overall Continuous Assessment components. For detailed information on the Course grading policy, please refer to The Student Handbook ('Award of Grades' section under Assessment and Examination Regulations). The Student Handbook is available from the Student Portal.

**Non-graded Learning Activities:**

Activities for the purpose of self-learning are present in each study unit. These learning activities are meant to enable you to assess your understanding and achievement of the learning outcomes. The type of activities can be in the form of Quiz, Review Questions, Application-Based Questions or similar. You are expected to complete the suggested activities either independently and/or in groups.



## 6. Course Schedule

To help monitor your study progress, you should pay special attention to your Course Schedule. It contains study unit related activities including Assignments, Self-assessments, and Examinations. Please refer to the Course Timetable in the Student Portal for the updated Course Schedule.

**Note:** You should always make it a point to check the Student Portal for any announcements and latest updates.

## 7. Learning Mode

The learning process for this course is structured along the following lines of learning:

- a. Self-study guided by the study guide units. Independent study will require *at least 2 hours per week*.
- b. Working on assignments, either individually or in groups.
- c. Classroom Seminar sessions (3 hours each session, 3 sessions in total).

### **iStudyGuide**

You may be viewing the iStudyGuide version, which is the mobile version of the Study Guide. The iStudyGuide is developed to enhance your learning experience with interactive learning activities and engaging multimedia. Depending on the reader you are using to view the iStudyGuide, you will be able to personalise your learning with digital bookmarks, note-taking and highlight sections of the guide.

### **Interaction with Instructor and Fellow Students**

Although flexible learning – learning at your own pace, space and time – is a hallmark at SUSS, you are encouraged to engage your instructor and fellow students in online discussion forums. Sharing of ideas through meaningful debates will help broaden your learning and crystallise your thinking.

### **Academic Integrity**

As a student of SUSS, it is expected that you adhere to the academic standards stipulated in The Student Handbook, which contains important information regarding academic policies, academic integrity and course administration. It is necessary that you read and understand the information stipulated in the Student Handbook, prior to embarking on the course.

**Study  
Unit**

**1**

**Tech Monopolies**

## Learning Outcomes

By the end of this unit, you should be able to:

1. Explain the differences between the 'platform' business model and the 'linear business model' (both terms are attributed to Alex Moazed and Nicholas L. Johnson; see main text for citations).
2. Explain why tech platforms possess so much disruptive power.
3. Develop arguments for and against curtailing tech monopoly power.
4. Illustrate the history of antitrust enforcement in the United States.
5. Define the different goals of antitrust enforcement.
6. Illustrate the basic details of the old antitrust cases against AT&T, IBM, and Microsoft and examine their relevance to contemporary debates on dealing with the rise of the tech giants.

## Overview

This unit focuses on tech monopoly power. It shows how the platform business model pursued by many of the tech giants gave them the ability to disrupt traditional industries and to dominate the online world. It also examines the arguments for and against curbing the power of the tech monopolies. In order to transform you into an informed participant in the current debates on managing tech monopoly power, this unit will introduce you to the history and the different goals of antitrust enforcement in the United States. Finally, this unit will illustrate the relevance of the old antitrust cases against AT&T, IBM, and Microsoft to contemporary debates on dealing with the rise of the tech giants.



### Lesson Recording

[Study Unit 1 Lesson Recording](#)

# Chapter 1: The Rise of the Tech Giants

## 1.1 The Platform Business Model

Apple became the world's first trillion-dollar public company in August 2018.<sup>1</sup> Amazon's stock breached the trillion-dollar mark in September 2018.<sup>2</sup> Microsoft's stock passed a trillion dollars in April 2019.<sup>3</sup> In 2018, the two largest Chinese companies by market value were Alibaba and Tencent; ten years earlier, state businesses, mainly in energy and finance, had accounted for the top nine largest Chinese companies by market value.<sup>4</sup>

We are living in the age of the tech giants. In order to understand how they achieved their size and power, we must examine their business model. The tech giants are operating a business model known as the platform. A platform, according to Alex Moazed and Nicholas L. Johnson, is 'a business that connects two or more mutually dependent groups in a way that benefits all sides.'<sup>5</sup> Apple's success, for example, can be attributed to its adoption of the platform business model. Apple forged an ecosystem for bridging consumers and producers via iOS, the App Store, and (the due to be shuttered) iTunes.

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<sup>1</sup> Chris Johnston, 'Apple is first public company worth \$1 trillion', *BBC News*, 2 August 2018. Available online at <https://www.bbc.com/news/business-45050213> (Last accessed on 26 June 2019).

<sup>2</sup> Rob Davies and Dominic Rushe, 'Amazon becomes world's second company to be valued at \$1tn', *The Guardian*, 4 September 2018. Available online at <https://www.theguardian.com/technology/2018/sep/04/amazon-becomes-worlds-second-1tn-company> (Last accessed on 26 June 2019).

<sup>3</sup> Tom Warren, 'Microsoft is now a \$1 trillion company', *The Verge*, 25 April 2019. Available online at <https://www.theverge.com/2019/4/25/18515623/microsoft-worth-1-trillion-dollars-stock-price-value> (Last accessed on 26 June 2019).

<sup>4</sup> Louise Lucas, 'The Chinese Communist Party entangles big tech', *The Financial Times*, 19 July 2019. Available online at <https://www.ft.com/content/5d0af3c4-846c-11e8-a29d-73e3d454535d> (Last accessed on 26 June 2019).

<sup>5</sup> Alex Moazed and Nicholas L. Johnson, *Modern Monopolies: What it Takes to Dominate the 21st-Century Economy* (New York, 2016), p. 5.

In doing so, it achieved a level of success that it might not have reached had it simply produced phones and computers.<sup>6</sup> Google similarly owes its dominance to its platform businesses like Google Search and the Android ecosystem.<sup>7</sup>

The platform principle is not new. A physical market counts as a platform; so does the stock exchange.<sup>8</sup> But platforms that are infused with the technological advancements of the digital revolution are able to amplify their 'reach, speed, convenience, and efficiency', achieving scale, power, and influence that, according to Jonathan Tepper, match the might and authority of governments.<sup>9</sup>

Platform businesses operate very differently from the industrial and commercial giants of the nineteenth and twentieth centuries. The purpose of a platform is to bridge 'consumers and producers' or buyers and sellers.<sup>10</sup> As Moazed and Johnson explain, 'Platforms build ecosystems'.<sup>11</sup> In contrast, the old business titans of the nineteenth and twentieth centuries based their operations on the 'linear business model'.<sup>12</sup> In other words, they developed and sold physical goods and/or services to consumers.<sup>13</sup>

The old business titans secured their dominance by raising the efficiency of their supply chains and building large vertically-integrated enterprises. This was, and remains, an asset-heavy business model. The task of engineering an efficient supply chain involves

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<sup>6</sup> Ibid., p. 6.

<sup>7</sup> Ibid.

<sup>8</sup> Geoffrey G. Parker, Marshall W. Van Alstyne, and Sangeet Paul Choudary, *Platform Revolution: How Networked Markets are Transforming the Economy and How to Make them Work for You* (New York, 2016), p. 60.

<sup>9</sup> Ibid.; and Jonathan Tepper (with Denise Hearn), *The Myth of Capitalism: Monopolies and the Death of Competition* (Hoboken, NJ, 2019), p. 92.

<sup>10</sup> Moazed and Johnson, *Modern Monopolies*, p. 6.

<sup>11</sup> Ibid., p. 7.

<sup>12</sup> Ibid., p. 22.

<sup>13</sup> Ibid.

massive investments in factories, distribution networks, and a sizeable employee force.<sup>14</sup> In contrast, the platform business model operated by the major tech companies is asset-light. Uber and Airbnb, for example, do not seek to build, maintain, or control large inventories of cars and homes through a linear supply chain.<sup>15</sup> This means that the costs of expanding a platform are smaller than those of expanding a linear business. For example, it is cheaper for Airbnb to expand its apartment listings than for a traditional hotel company to build and staff new hotels.<sup>16</sup> Platforms, moreover, can be maintained without massive workforces. Whatsapp, for example, only had 55 employees when it was acquired by Facebook in 2014.<sup>17</sup>

Moazed and Johnson note that ‘platform business models enable companies to expand at a pace unprecedented in human history.’<sup>18</sup> Platforms are able to scale up rapidly due to the dynamics of strong network effects. This means that there is a direct relationship between the number of people and entities on a platform and the value that is generated for each person or entity<sup>19</sup> : more drivers on Uber attracts more passengers, which in turn attracts yet more drivers to Uber; more sellers on TaoBao or Tmall attracts more buyers, which in turn attracts yet more sellers to TaoBao or Tmall.<sup>20</sup> Powered by network effects, platform businesses, according to Parker, Van Alstyne, and Choudary, ‘are able to build open electronic ecosystems embracing hundreds, thousands, or millions of remote

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<sup>14</sup> Ibid., 22, 24-25.

<sup>15</sup> Ibid., 29-30.

<sup>16</sup> Ibid., p. 87.

<sup>17</sup> Ibid., p. 87; and Akshat Rathi, ‘Whatsapp bought for \$19 billion, what do its employees get?’, *The Conversation*, 21 February 2014. Available online at <https://theconversation.com/whatsapp-bought-for-19-billion-what-do-its-employees-get-23496> (Last accessed on 1 July 2019).

<sup>18</sup> Moazed and Johnson, *Modern Monopolies*, p. 31.

<sup>19</sup> Parker, Van Alstyne, and Choudary, *Platform Revolution*, p. 17.

<sup>20</sup> Moazed and Johnson, *Modern Monopolies*, p. 81; Parker, Van Alstyne, and Choudary, *Platform Revolution*, p. 65.



participants.<sup>21</sup> This allows the tech platforms to coordinate more resources and generate more value than traditional linear businesses.<sup>22</sup> It is thus becoming difficult for traditional linear businesses, which 'continue to compete on the basis of resources that are owned internally', to meet the competitive challenge posed by the major tech platforms.<sup>23</sup>

In order to understand why the major tech platforms are able to coordinate vast networks of people and resources, we have to pay attention to two other features of platform businesses. Firstly, tech platforms lower transaction costs – the 'cost of participating in an interaction' – for users.<sup>24</sup> E-commerce platforms like Amazon and TaoBao lower the amount of time and energy that users need to expend in order to seek out the goods that they want.<sup>25</sup> They also ensure that each transaction proceeds smoothly; so-called 'bargaining costs' are lowered and there are mechanisms in place to ensure that both parties to the transaction will behave with propriety.<sup>26</sup> Secondly, tech platforms also 'enable complementary innovation.'<sup>27</sup> The Android and iOS ecosystems, for example, have unleashed the creative energies of developers all over the world. Certain platforms, e-commerce platforms in particular, are focused on lowering transaction costs for users; others are focused on providing a robust framework for encouraging the creation of new digital products or digital content. According to Moazed and Johnson, the former may be termed 'exchange platforms' while the latter may be termed 'maker platforms'.<sup>28</sup> Both, however, are able to scale up rapidly through network effects.

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<sup>21</sup> Parker, Van Alstyne, and Choudary, *Platform Revolutions*, p. 65.

<sup>22</sup> Ibid.

<sup>23</sup> Ibid.

<sup>24</sup> Moazed and Johnson, *Modern Monopolies*, p. 36.

<sup>25</sup> Ibid., pp. 36-37.

<sup>26</sup> Ibid., p. 37.

<sup>27</sup> Ibid., p. 38.

<sup>28</sup> Ibid., p. 41.

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## 1.2 Platform ‘Gatekeepers’<sup>29</sup>

Moazed and Johnson have pointed out that ‘the open Internet is a myth.’<sup>30</sup> The internet is only free and open to the extent that anyone can set up online business operations: anyone or any business entity can sell goods through Amazon or distribute and monetise their video content through YouTube. But the fact of the matter is that these transactions will be mediated, governed, and controlled by a narrow range of dominant tech platforms.<sup>31</sup> ‘In the United States during 2015,’ Moazed and Johnson observe, ‘every one of the top ten trafficked US websites was a platform, as were twenty of the top twenty-five.’<sup>32</sup> In the smartphone arena, Android and iOS account for over 90 percent of the smartphone OS market.<sup>33</sup>

In emerging economies, internet platforms may be even more dominant than their American counterparts due to deficiencies in traditional infrastructure.<sup>34</sup> ‘After Google left in 2010,’ Chen Xinlei notes, ‘Baidu cornered 70 per cent of the revenue in the search business in China; in e-commerce, Alibaba takes up 80 per cent of the online shopping revenue; and Tencent has 500 million active WeChat users and 815 million QQ users – about 60 per cent of the country’s total population.’<sup>35</sup>

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<sup>29</sup> The ‘gatekeepers’ description is taken from Lina M. Khan, ‘The Separation of Platforms and Commerce’, *Columbia Law Review* 119 (2019), p. 973.

<sup>30</sup> Moazed and Johnson, *Modern Monopolies*, p. 18.

<sup>31</sup> *Ibid.*, pp. 18-19.

<sup>32</sup> *Ibid.*, p. 18.

<sup>33</sup> *Ibid.*, p. 99.

<sup>34</sup> *Ibid.*, pp. 18-19.

<sup>35</sup> Chen Xinlei, ‘China’s digital monopolies are killing competition and need to be regulated’, *South China Morning Post*, 20 August 2015. Available online at <https://www.scmp.com/comment/insight-opinion/article/1850448/chinas-digital-monopolies-are-killing-competition-and-need> (Last accessed on 27 June 2019).

The major tech platforms are ‘gatekeepers’ as much as they are central coordinators.<sup>36</sup> Anyone hoping to launch a successful online business or to establish a visible online presence has to rank highly on Google or attract a massive number of subscribers on YouTube. Small online entrepreneurs in China would find it difficult to avoid using Alipay or Tenpay.<sup>37</sup> It is undeniable that the tech giants now wield enormous power and influence over society and will continue to shape our lives for the foreseeable future.

At the time of writing, a fierce debate is raging on in the United States as to whether or not the tech giants should be broken up. Senator Elizabeth Warren has called for the breaking up of the tech giants. Not everyone agrees with this course of action, but many politicians have noted the need for stricter regulation of the tech giants.<sup>38</sup> Although antitrust action was taken against Microsoft in the late 1990s, American regulators, until recently, have largely taken a favourable view of the tech giants. The tech giants’ provision of free or cheap online services and high-quality consumer goods seemed to show that the market was working efficiently.<sup>39</sup> But there is a growing realization that the interests of the tech giants may not be consistent with the public interest. The tech giants have resorted to heavy-handed tactics to weaken their competitors. Moreover, the privacy scandals centred on Facebook (see Study Unit 3) have damaged Big Tech’s public image. These growing concerns about tech monopoly power are also intertwined with and driven by broader concerns about the widening gap between the rich and the poor.<sup>40</sup>

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<sup>36</sup> Khan, ‘The Separation of Platforms and Commerce’, p. 973.

<sup>37</sup> Moazed and Johnson, *Modern Monopolies*, p. 19.

<sup>38</sup> Matt Yglesias, ‘The push to break up Big Tech, explained’, *Vox*, 3 May 2019. Available online at <https://www.vox.com/recode/2019/5/3/18520703/big-tech-break-up-explained> (Last accessed on 1 July 2019).

<sup>39</sup> *Ibid.*

<sup>40</sup> *Ibid.*



## Activity 1

Pick one of the following tech giants – Facebook, Amazon, Apple, Google, Baidu, Alibaba, or Tencent – and answer question 1 and either question 2 or 3.

1. How was the expansion of your tech giant driven by network effects?
2. How does/do your tech giant's platform(s) reduce transaction costs for its users?
3. How does/do your tech giant's platform(s) provide a framework for encouraging the production of digital products and content?

If external readings are consulted, use only peer-reviewed academic sources published by academic presses (monographs, scholarly journal articles, and edited volumes). For online search engines, Google Scholar is recommended for this exercise. Use Google Scholar for locating relevant peer-reviewed academic sources and share your findings with your classmates on Google Docs.

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## Chapter 2: Confronting Tech Monopoly Power

### 2.1 Is Competition Important?

The critics of tech monopoly power argue that market competition is necessary in order to promote economic justice and vitality. It prevents the ‘transfer of wealth from consumer or supplier to the monopolist’; it creates choice and efficiency; it encourages ‘individual initiative and freedom’; and it promotes scientific and technological advancement.<sup>41</sup> Competition, in short, leads to economic vigour and growth. ‘Competition’, according to Jonathan Tepper, ‘is the basis for evolution.’ ‘An absence of competition’, he warns, ‘means an absence of evolution, a failure to adapt to new conditions. It threatens our survival.’<sup>42</sup> In the United States, market competition is also traditionally viewed as an essential quality of a healthy and sustainable democracy. By preventing private entities and individuals from amassing too much economic power in their hands, competition deepens the strength of democratic institutions<sup>43</sup>

According to the legal scholar Tim Wu, the rise of populism and nationalism in recent years can be traced to growth of monopoly power. ‘The concentration of wealth and power’, he argues, ‘has helped transform and radicalize electoral politics.’<sup>44</sup> The failure to ‘control private power’ and improve the economic welfare of the public will lead to the rise of strongmen and dictators.<sup>45</sup>

But not all commentators believe that the tech monopolies are a threat to the public interest. The Silicon Valley entrepreneur Peter Thiel has argued that the typical tech monopoly, by virtue of the fact that it faces weak competition, would be in a stronger

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<sup>41</sup> Tepper (with Hearn), *Myth of capitalism*, pp. XV-XVI.

<sup>42</sup> *Ibid.*, p. XVI.

<sup>43</sup> *Ibid.*, p. XV; Tim Wu, *The Curse of Bigness: Antitrust in the New Gilded Age* (New York, 2018), pp. 14-16, 31.

<sup>44</sup> Wu, *The Curse of Bigness*, p. 15.

<sup>45</sup> *Ibid.*, pp. 14-15.

position to pursue moral objectives.<sup>46</sup> ‘Monopolists’, he explains ‘can afford to think about things other than making money; non-monopolists can’t.’<sup>47</sup> Moreover, it is important, he stresses, to distinguish between harmful monopolies and innovative monopolies. A harmful monopoly that dominates a particular market will be able to artificially reduce its supply of goods and services and raise its prices without fear of losing its customers.<sup>48</sup> In this situation, the monopoly is indeed simply transferring wealth from the public to its own pockets. An innovative monopoly, on the other hand, creates choice, quality, and plenitude for the consumer.<sup>49</sup> Governments, according to Peter Thiel, have long been aware of the distinction between good and bad monopolies. They create good monopolies by granting patents to innovators and confront bad ones with antitrust action.<sup>50</sup> Monopoly power, Peter Thiel believes, is, in fact, good for innovation. Without the right to charge monopoly prices and accumulate monopoly profits for an extended period of time, entrepreneurs and businesses will lack the willingness and the ability to undertake risky and long-term research and innovation schemes.<sup>51</sup>

Others have noted that the tech monopolies are simply the result of the ‘winner-take-all’ nature of platform competition.<sup>52</sup> Ming Zeng, Alibaba’s Chief Strategy Officer, has compared the competition between rival platforms to war between states.<sup>53</sup> The competition between rival platforms offering roughly similar products and services often leads to one dominant victor because of the network effects that drive the growth of all

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<sup>46</sup> Peter Thiel (with Blake Masters), *Zero to One: Notes on Startups, or How to Build the Future* (London, 2014), p. 31.

<sup>47</sup> *Ibid.*, pp. 31-32.

<sup>48</sup> *Ibid.*, p. 32.

<sup>49</sup> *Ibid.*

<sup>50</sup> *Ibid.*

<sup>51</sup> *Ibid.*, p. 33.

<sup>52</sup> Moazed and Johnson, *Modern Monopolies*, p. 99

<sup>53</sup> *Ibid.*, p. 95.

platforms.<sup>54</sup> According to Chen Xinlei, ‘the more users one website has the more likely new users will be attracted to it. This is why the “winner takes all” effect is particularly strong in the internet industry.’ ‘The mergers’, he notes, ‘of Youku and Tudou (online video streaming sites), 58 Tongcheng and Ganji (Craigslist-like sites) and Didi and Kuaidi (taxi hailing apps) are all proof of this phenomenon.’<sup>55</sup> The tech giants, as Moazed and Johnson note, are natural monopolies.<sup>56</sup> Network effects, moreover, are often further enhanced at the personal level. In other words, ‘a platform becomes even more valuable the more that you engage with it.’<sup>57</sup> E-commerce platforms, for example, enhance network effects at the personal level by making recommendations based on their users’ purchase histories, limiting the attractiveness of starting anew on a competing platform.<sup>58</sup>

The rise of Alibaba clearly demonstrates the ‘winner-take-all’ nature of platform competition.<sup>59</sup> In the early 2000s, eBay made a major push into the Chinese e-commerce market by acquiring a Chinese e-commerce site called EachNet.<sup>60</sup> But it quickly made a series of strategic errors. It levied transaction fees on sellers and barred its users from communicating with each other before the conclusion of a transaction.<sup>61</sup> Alibaba saw an opportunity to capitalise on eBay’s mistakes. It declared that TaoBao would be free for three years and started a chat service (Wangwang) for TaoBao’s users, enabling

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<sup>54</sup> Chen Xinlei, ‘China’s digital monopolies are killing competition and need to be regulated’, *South China Morning Post*, 20 August 2015. Available online at <https://www.scmp.com/comment/insight-opinion/article/1850448/chinas-digital-monopolies-are-killing-competition-and-need> (Last accessed on 27 June 2019).

<sup>55</sup> Ibid.

<sup>56</sup> Moazed and Johnson, *Modern Monopolies*, p. 103.

<sup>57</sup> Ibid., p. 100.

<sup>58</sup> Ibid.

<sup>59</sup> Ibid., p. 99.

<sup>60</sup> Ibid., pp. 95-96.

<sup>61</sup> Ibid., p. 96.

buyers and sellers to negotiate with each other.<sup>62</sup> Sellers were also assessed by buyers through an effective ratings mechanism.<sup>63</sup> These features, along with Alipay, which was introduced in 2005, heightened the network effects driving TaoBao's growth and led to eBay's withdrawal from the Chinese market in 2006.<sup>64</sup> With eBay defeated, Alibaba now turned its attention to the challenge of generating revenue for TaoBao. Instead of levying fees on its users, it chose to monetise TaoBao through advertising.<sup>65</sup> To maximize the effectiveness of this strategy, Alibaba blocked Baidu from crawling TaoBao web pages. This move prevented consumers from starting their product searches on Baidu rather than TaoBao, limiting the loss of advertising revenue for the latter.<sup>66</sup>

It is important to note the 'winner-take-all' nature of Alibaba's victory. For example, eBay was not merely defeated; it was forced to vacate the Chinese market completely.<sup>67</sup> The decision to block Baidu also hobbled its growth. Moazed and Johnson note that Baidu's 'failure to dominate product search is a big reason why it's a much less successful business than either Alibaba or Google.'<sup>68</sup>

It is unfair, according to Moazed and Johnson, to argue that the tech giants of today are similar to the industrial monopolies of the nineteenth and twentieth centuries. A traditional linear business acquires dominance by increasing the amount of assets it owns or controls: e.g. deposits of natural resources, factories, and critical infrastructure.<sup>69</sup> In contrast, the platforms run by the tech giants achieved scale and influence by connecting a growing number of users. 'In other words,' Moazed and Johnson explain, 'platforms

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<sup>62</sup> Ibid.

<sup>63</sup> Ibid.

<sup>64</sup> Ibid. pp. 96-97.

<sup>65</sup> Ibid., p. 97.

<sup>66</sup> Ibid., pp. 97-98.

<sup>67</sup> Ibid., p. 99.

<sup>68</sup> Ibid.

<sup>69</sup> Ibid., pp. 100-101



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become dominant not because of *what they own* but rather because of the *value they create* by connecting their users.<sup>70</sup> This explains the popularity of the tech companies among consumers. As the economic journalist Matt Yglesias has pointed out, the criticisms directed against the tech giants by politicians and media personalities may not reflect the actual popularity of these companies. Some polls seem to indicate that several of the tech giants and the tech industry as a whole are still popular among Americans.<sup>71</sup> The tech giants thus appear to be ‘monopolies of the willing, built from the bottom up.’<sup>72</sup> They are built ‘on participation, not ownership’ and as a result they are not as heavily fortified or dug in, so to speak, as the industrial monopolies of the nineteenth and twentieth centuries.<sup>73</sup>

Moreover, as shown above, platform rivalry often leads to ‘winner-take-all’ outcomes. The lack of competition in certain platform spaces should therefore not be regarded as a troubling development. The dominant platforms are natural monopolies whose growth was built on the power of network effects.<sup>74</sup> A dominant platform provides ‘more value, more efficiency and greater convenience for users.’<sup>75</sup> These benefits would be lost in conditions of excessive competition.<sup>76</sup> Like Peter Thiel, Moazed and Johnson point out that the tech giants have served the interests and the welfare of consumers and the broader public by creating new markets and jobs. Uber and Airbnb massively expanded the market for ‘cabs’ and ‘hotels’; the Android and iOS ecosystems have created

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<sup>70</sup> Ibid., p. 101. Emphasis supplied.

<sup>71</sup> Matt Yglesias, ‘The push to break up Big Tech, explained’, *Vox*, 3 May 2019. Available online at <https://www.vox.com/recode/2019/5/3/18520703/big-tech-break-up-explained> (Last accessed on 1 July 2019).

<sup>72</sup> Moazed and Johnson, *Modern Monopolies*, p. 102.

<sup>73</sup> Ibid., p. 101.

<sup>74</sup> Ibid., p. 103.

<sup>75</sup> Ibid.

<sup>76</sup> Ibid.

new opportunities for aspiring developers.<sup>77</sup> This should be contrasted with the selfish behaviour of a traditional industrial monopolist who creates artificial scarcity in order to boost prices and profits at the expense of public welfare.

It has also been argued that, unlike the monopolists of the past, today's tech giants are operating in an extremely competitive business environment. The role of network effects may enforce user loyalty, but in theory there is nothing to prevent users from leaving their current platforms for a rival platform.<sup>78</sup> In contrast, it was harder to escape from the clutches of the older industrial monopolies like Standard Oil and AT&T because they owned and controlled vast amounts of physical assets, particularly infrastructure.<sup>79</sup> The tech giants also compete ferociously with each other. We have already seen how unrelenting Alibaba was in its assault on eBay and Baidu. Furthermore, '[b]arriers to entry', according to Moazed and Johnson, 'in most industries are far lower than they were a century ago, while the boundaries between industries also are much more fluid than they have been in the past.'<sup>80</sup> In the past, the task of unseating a traditional industrial monopolist would require massive investments in physical assets. The costs of launching a new tech company today are far lower.<sup>81</sup> The tech giants are also constantly encroaching on each other's turf. For example, when Amazon launched the ebook industry, Apple and Google quickly followed suit as competitors.<sup>82</sup> The rapid pace of technological advancement today may also imply that the tech giants will not be able to maintain their monopoly positions for as long as the industrial monopolies of the past did.<sup>83</sup> At the start of the 21<sup>st</sup> century, industry observers were expecting either Nokia or Microsoft to control

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<sup>77</sup> Ibid., pp. 103-104.

<sup>78</sup> Ibid., p. 105.

<sup>79</sup> Ibid.

<sup>80</sup> Ibid.

<sup>81</sup> Ibid., pp. 105-106.

<sup>82</sup> Ibid., p. 105.

<sup>83</sup> Ibid.

the smartphone OS space. Instead, iOS and Android eventually emerged as the dominant platforms.<sup>84</sup>

Moazed and Johnson do not deny that it is possible for the tech giants to act against the public interest. But the right response 'is not to limit the market power of these platform businesses – a move that would likely diminish overall consumer welfare – but rather to address the behavior of these businesses in specific areas of concern.'<sup>85</sup>

But is it really accurate to claim that the tech giants are different from the industrial monopolies of the nineteenth and twentieth centuries? The tech giants would appear to be very asset-heavy, for example, if we were to treat data as an asset.<sup>86</sup> Jack Ma, for example, once compared data to energy. The tech giants' revenue models depend heavily on monetising the data collected from their users' activities (see Study Unit 3). In 2010, Eric Schmidt announced that Google could amass, within two days, the same amount of data generated by human civilization up to 2003: a total of 5 exabytes of data.<sup>87</sup> In addition to control of data, the natural resource of the future, the tech giants' control of web traffic is also a cause for concern. A e-commerce giant, for example, has the capacity to shape the sales of online vendors by modifying its algorithms.<sup>88</sup> Perhaps, as Chen Xinlei warns, 'a digital monopoly is not that different from monopoly in oil or the railway.'<sup>89</sup>

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<sup>84</sup> Ibid., p. 106.

<sup>85</sup> Ibid., p. 108.

<sup>86</sup> Chen Xinlei, 'China's digital monopolies are killing competition and need to be regulated', South China Morning Post, 20 August 2015. Available online at <https://www.scmp.com/comment/insight-opinion/article/1850448/chinas-digital-monopolies-are-killing-competition-and-need> (Last accessed on 27 June 2019).

<sup>87</sup> Ibid.

<sup>88</sup> Ibid.

<sup>89</sup> Ibid.

## 2.2 Defining and Curbing Monopoly Behaviour

How do we determine whether or not a large company (or group of companies) is behaving like a monopoly and acting in ways that are harmful to the public interest? What are the appropriate penalties that governments should impose on large companies that are guilty of harmful monopolistic conduct? These questions have triggered different responses over the past 130 years or so. It is important to understand that the goals of antitrust enforcement have not remained constant throughout history.

In 1890, the United States Congress passed America's first antitrust law, the Sherman Act. This law made it illegal to form a monopoly and to pursue anti-competitive business practices. The Sherman Act was a response to the growth of monopoly power in the late nineteenth and early-twentieth centuries.<sup>90</sup> Senator John Sherman, who introduced the bill in the Senate, was concerned about monopoly pricing.<sup>91</sup> This refers to the ability of a monopoly that faces weak competition to raise its prices by reducing its output of goods and services without worrying about losing its customers. However, as the legal scholar Tim Wu has highlighted, Senator John Sherman was also deeply concerned about inequality and the threat posed by private power to democracy.<sup>92</sup> According to Senator John Sherman, the massive accumulation of power in the hands of a private individual was not acceptable in a democracy.<sup>93</sup> The Sherman Act was eventually enforced by President Theodore Roosevelt (1901-1909), who broke up the Northern Securities Company and Standard Oil.<sup>94</sup> Roosevelt, Tim Wu notes, saw the Sherman Act as a weapon to be used against 'the danger of private economic power that might rival public power.'<sup>95</sup>

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<sup>90</sup> Wu, *The Curse of Bigness*, pp. 24-31.

<sup>91</sup> *Ibid.*, p. 31.

<sup>92</sup> *Ibid.*

<sup>93</sup> *Ibid.*

<sup>94</sup> *Ibid.*, ch. 3.

<sup>95</sup> *Ibid.*, p. 54.

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One of his goals was to demonstrate and enforce ‘the supremacy of elected government.’<sup>96</sup>

However, antitrust law in the United States today is mainly focused on ensuring lower prices for consumers. This approach, known as the ‘“consumer welfare” approach’, gained influence in the 1980s under the pro-business Reagan administration.<sup>97</sup> The ‘consumer welfare’ approach is narrower than President Theodore Roosevelt’s or Senator John Sherman’s understanding of the goals of antitrust law. We must bear in mind that a large and powerful company has the ability to hurt society in many different ways. But the ‘consumer welfare’ approach is mainly concerned with the danger of higher prices for consumers.<sup>98</sup>

The weaknesses of the ‘consumer welfare’ approach become obvious when we apply it to the tech giants. The tech giants offer many of their high-quality products and services for free. Therefore, according to the ‘consumer welfare’ approach, there is no need to take action against them even if they are growing bigger and stronger.<sup>99</sup> But this would involve ignoring the fact that the actions of the tech giants also ‘generate a lot of non-price complaints.’<sup>100</sup> For example, some of the ‘non-price complaints’ directed at Facebook are related to privacy concerns and the online spread of fake news and other forms of harmful content (see Study Unit 3). There is no reason to ignore these ‘non-price complaints’ in the enforcement of antitrust law.<sup>101</sup> Fake news, for example, is a threat to democracy (see

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<sup>96</sup> Ibid., p. 66.

<sup>97</sup> Ibid., p. 17; Matt Yglesias, ‘The push to break up Big Tech, explained’, *Vox*, 3 May 2019. Available online at <https://www.vox.com/recode/2019/5/3/18520703/big-tech-break-up-explained> (Last accessed on 1 July 2019).

<sup>98</sup> Wu, *The Curse of Bigness*, p. 17.

<sup>99</sup> Matt Yglesias, ‘The push to break up Big Tech, explained’, *Vox*, 3 May 2019. Available online at <https://www.vox.com/recode/2019/5/3/18520703/big-tech-break-up-explained> (Last accessed on 1 July 2019).

<sup>100</sup> Ibid.

<sup>101</sup> Ibid.

Study Unit 3). As shown earlier, President Theodore Roosevelt, over a hundred years ago, believed that one of the goals of antitrust law was to protect the ‘supremacy of elected government.’<sup>102</sup>

The ‘consumer welfare’ approach also ignores the interests of producers.<sup>103</sup> As explained above, tech platforms bridge consumers and producers. A video-streaming platform bridges content producers and content viewers; an e-commerce giant bridges sellers and consumers. The content viewers on the video-streaming platform may get to watch videos for free and the consumers on the e-commerce platform may benefit from low prices; but this does not necessarily mean that the producers on these platforms are being treated fairly. As Nicholas L. Johnson points out, ‘in most cases, platform monopolies typically exercise their market power against their other customer group, producers.’<sup>104</sup>

Amazon, for example, markets *its own goods and brands* on its e-commerce platform. This means that, in addition to bridging buyers and sellers, it also directly competes with the sellers on its platform. Moreover, the prices of its own products appear to be lower than those sold by third-party sellers on its platform.<sup>105</sup> This is a standard practice in the retail industry, but Amazon’s access to the large amounts of data created by the activity on its platform gives it an enormous advantage in marketing its own goods and brands.<sup>106</sup>

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<sup>102</sup> Wu, *The Curse of Bigness*, p. 66.

<sup>103</sup> Nicholas L. Johnson, ‘A Better Way to Draft Platform Regulation’, *Applico* (Blog post on Applico’s company website), 16 March 2019. Available online at <https://www.applicoinc.com/blog/best-solution-for-tech-platform-regulation/> (Last accessed on 29 June 2019).

<sup>104</sup> Ibid.

<sup>105</sup> Leticia Miranda, ‘Amazon sellers say the tech giant is crushing them with competitive pricing’, *BuzzfeedNews*, 13 June 2018. Available online at <https://www.buzzfeednews.com/article/leticiamiranda/amazon-sellers-say-the-tech-giant-is-crushing-them-with> (Last accessed on 29 June 2019).

<sup>106</sup> Ibid.

Amazon's conduct does not result in higher prices for consumers. But the sellers on its platform may feel that they are being treated unfairly.<sup>107</sup>

Google, according to Jonathan Tepper, has a similar capacity for exploiting its position as a dominant platform in order to weaken its competitors. 'Given that Google', Jonathan Tepper explains, 'is the doorway through which people enter the internet, the search engine can effectively shut out competitors by demoting them or taking their data.'<sup>108</sup> After Yelp – a business ratings website – rebuffed Google's attempt to acquire it, Google simply scraped the content on Yelp's web pages. This reduced the need to visit Yelp's website in order to access its information.<sup>109</sup> Yelp later accused Google of engaging in monopolistic behaviour.<sup>110</sup> Google's behaviour did not limit consumers' 'free' access to useful information. But Yelp's side of the story also needs to be acknowledged.

In the United States, Senator Elizabeth Warren is one of the most outspoken advocates of breaking up the tech giants and strictly regulating their conduct. In particular, Senator Warren wants to ensure that the tech platforms restrict their activities to acting as intermediaries. This means, for example, that an e-commerce company would not be allowed to sell the same products as the third party vendors operating on its platform.<sup>111</sup>

The tech giants have naturally argued that it would be counter-productive to break them up. Facebook's Chief Operating Officer Sheryl Sandberg has suggested that dismantling the American tech giants would simply hand the advantage in the global race for tech

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<sup>107</sup> Ibid.

<sup>108</sup> Tepper (with Hearn), *The Myth of Capitalism*, p. 90.

<sup>109</sup> Ibid., p. 89.

<sup>110</sup> Peter Kafka, 'When US regulators investigated Google before, they gave it a pass. What about now?', *Vox*, 4 June 2019. Available online at <https://www.vox.com/recode/2019/6/4/18652877/google-doj-antitrust-regulators-europe-yelp-fines> (Last accessed on 29 June 2019).

<sup>111</sup> Matt Yglesias, 'The push to break up Big Tech, explained', *Vox*, 3 May 2019. Available online at <https://www.vox.com/recode/2019/5/3/18520703/big-tech-break-up-explained> (Last accessed on 27 June 2019).

supremacy to the Chinese tech giants.<sup>112</sup> Such arguments, to a certain extent, reflect the assumption that larger firms are more efficient than smaller ones.<sup>113</sup> But, according to Tim Wu, many earlier cases of antitrust enforcement were followed by beneficial economic effects. The American oil industry did not slide into decline after Standard Oil was broken up in 1911. '[T]o the surprise of many observers,' Tim Wu notes, 'within a year, the value of what had been Standard Oil had doubled, and in several years, had increased five-fold.'<sup>114</sup> Tim Wu also argues that the rise of the modern tech industry in the United States was built on the old antitrust cases against AT&T, IBM, and Microsoft.<sup>115</sup>

AT&T was a telecommunications monopoly. But in 1974, the US Justice Department filed suits against it, leading to the breaking up of the monopoly in the early 1980s. AT&T, according to the US government, had supplied its competitors with shoddy upkeep services, denied them access to local interconnection services, and tried to curb the size of rival local networks.<sup>116</sup> The breaking up of AT&T, Tim Wu notes, was followed by the growth of 'entirely new types of industries unimagined or unimaginable during the reign of AT&T.'<sup>117</sup> Japan and Europe, in contrast, did not break up their telecommunications monopolies in the 1980s. According to Tim Wu, the fact that the internet revolution eventually took place in the United States rather than Europe or Japan, which was the United States' main technological competitor in the 1980s, can be partially attributed to the decision to break up AT&T.<sup>118</sup>

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<sup>112</sup> Emily Stewart, 'Facebook's latest reason it shouldn't be broken up: Chinese tech companies will dominate', *Vox*, 20 May 2019. Available online at <https://www.vox.com/recode/2019/5/20/18632669/sheryl-sandberg-break-up-facebook-china-cnbc> (Last accessed on 29 June 2019).

<sup>113</sup> Wu, *The Curse of Bigness*, p. 68.

<sup>114</sup> *Ibid.*

<sup>115</sup> *Ibid.*, pp. 97-98, 100, 110, and 112.

<sup>116</sup> Khan, 'The Separation of Platforms and Commerce', pp. 1049-1050.

<sup>117</sup> Wu, *The Curse of Bigness*, pp. 96-97.

<sup>118</sup> *Ibid.*, pp. 97-98.



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The US Justice Department filed suit against IBM in 1969. This led to a massive and long-drawn-out case that was eventually dropped by the Reagan administration in 1982. IBM was not broken up in the end.<sup>119</sup> Nevertheless, during the long duration of the case, the company ‘steered shy of anything close to anticompetitive conduct, for fear of adding to the case against it.’<sup>120</sup> This, according to Tim Wu, had a decisive impact on the personal computer industry. IBM chose ‘an extremely open design’ for the IBM PC.<sup>121</sup> It also maintained a professional distance from the suppliers of the IBM PC’s components; it did not acquire them or seek to dominate them. These suppliers included Intel and Microsoft. It may be said that the IBM antitrust suit played a role in the ‘the rise of firms like Apple and Microsoft.’<sup>122</sup>

The US Justice Department filed suit against Microsoft in 1998. In the 1990s, the popularity of Netscape’s Navigator browser seemed to suggest a future in which the web browser would overtake the operating system in terms of importance.<sup>123</sup> Confronted with this threat to its dominance, Microsoft launched an all-out campaign to conquer the web browser market.<sup>124</sup> Microsoft leveraged its dominant position in the operating system space to crush Netscape. It built its own browser – Internet Explorer – and bundled it with Windows, making it ‘the default browser for every PC sold.’<sup>125</sup> Netscape was defeated, but Microsoft’s aggressive tactics paved the way for the Justice Department’s antitrust suit.<sup>126</sup> Microsoft was not broken up in the end, but it subsequently saw a need to behave

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<sup>119</sup> For a brief summary of the antitrust case against IBM, see Wu, *The Curse of Bigness*, pp. 110-111.

<sup>120</sup> Wu, *The Curse of Bigness*, p. 112.

<sup>121</sup> Ibid.

<sup>122</sup> Ibid.

<sup>123</sup> John Naughton, ‘Netscape: the web browser that came back to haunt Microsoft’, *The Guardian*, 22 March 2015. Available online at <https://www.theguardian.com/global/2015/mar/22/web-browser-came-back-haunt-microsoft> (Last accessed on 29 June 2019).

<sup>124</sup> Ibid.

<sup>125</sup> Ibid.

<sup>126</sup> Ibid.

more carefully.<sup>127</sup> The Microsoft antitrust case, Tim Wu argues, ‘must be given credit for preventing the giant from dominating the nascent web economy of the early 2000s.’<sup>128</sup>

The past is an imperfect guide to the future. It would be wrong to conclude automatically that the tech giants of today should be broken up because AT&T’s dissolution was followed by a wave of innovation. As mentioned earlier, there are alternatives to breaking up the tech giants; it is possible to regulate the particular areas in their business practices that may be harmful to the public interest. But this study unit has clearly shown that the growth of the tech giants is shaped by the wider policy environment. Would Facebook have been allowed to acquire Instagram and Whatsapp if antitrust enforcement had been stricter? Facebook, Google, and Amazon have made dozens of acquisitions.<sup>129</sup> But, according to Tim Wu, this was possible because the US government ‘gave the major tech players a pass – even when confronting fairly obvious dangers and anticompetitive mergers.’<sup>130</sup> The media today celebrates the founders of the tech giants as public heroes and gurus. It is true that the tech giants are run by ambitious and intelligent leaders and that they produce high-quality products and services. But what the government does or does not do also matters. In Study Unit 2, we will examine the role of the state in promoting and shaping the growth of the tech sector.



## Reflect

Can you live without the products, services, and platforms of the tech giants?

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<sup>127</sup> Richard Blumenthal and Tim Wu, ‘What the Microsoft antitrust case taught us’, *The New York Times*, 18 May 2018. Available online at <https://www.nytimes.com/2018/05/18/opinion/microsoft-antitrust-case.html> (Last accessed on 29 June 2019).

<sup>128</sup> Wu, *The Curse of Bigness*, p. 110.

<sup>129</sup> *Ibid.*, p. 123.

<sup>130</sup> *Ibid.*, p. 121.

Can you get through daily life without using any of the major tech platforms? Reflect on this in order to assess the impact of tech monopoly power on your individual existence. If you cannot live without them, it may mean that they have become too powerful.

### Research

Find out more about the details of the antitrust cases against AT&T, IBM, and Microsoft and reflect on the relevance of these cases to the current debates on managing tech monopoly power.



### Watch

*The Economist*, 'How to tame tech giants', published on 4 September 2018 on YouTube. Available online at <https://www.youtube.com/watch?v=pHH8NXunroY> (Last accessed on 1 July 2019).

### Case Study

Do you think that the Chinese tech giants will win the race for global tech supremacy if the American tech giants are broken up? Reflect on the ways in which the American tech sector could become even stronger if the current American tech giants are broken up.

## Summary

This study unit has shown that the disruptive power and global dominance of the tech giants must be understood partly in terms of their unique platform business model. The purpose of a platform is to connect producers and consumers or buyers and sellers. The purpose of a traditional linear business, on the other hand, is to develop and sell products and services to consumers. Network effects play a major role in the rapid expansion of tech platforms, allowing them to marshal more resources and produce more value than traditional linear businesses.

But the might and power of the tech giants have led to a great deal of public unease. Some public figures have argued that the tech giants are harmful monopolies that should be broken up. The critics of monopoly power argue that competition leads to equality, promotes growth and innovation, and safeguards the health of democratic institutions. The defenders of the tech monopolies argue that they are natural monopolies that emerged naturally out of the 'winner-take-all' platform competition environment. According to Peter Thiel, monopolies are in a stronger position to pursue ethical goals. It is also important to distinguish between harmful monopolies and innovative monopolies whose activities ultimately benefit consumers. Moreover, the ability to charge monopoly prices will incentivise businesses to invest in risky, long-term innovation.

This study unit has also shown that the goals of antitrust enforcement in the United States have changed over the past hundred years or so. Today, the main goal of antitrust enforcement in the United States is to ensure lower prices for consumers. But, in the past, antitrust enforcement was also driven by the goal of limiting private power in order to protect democracy. The current antitrust focus on ensuring lower prices for consumers may not be adequate for addressing the challenge of tech monopoly power. The tech giants offer many of their high-quality products and services for free or at low prices, which benefits the consumer. But several of the major public concerns about the tech giants' behaviour have nothing to do with the prices of their products and services.

The case for breaking up the tech giants is partly built on the lessons learnt from the old antitrust cases against AT&T, IBM, and Microsoft. These results of these cases, according to the legal scholar Tim Wu, created conditions for the rise of the modern tech sector. By implication, breaking up the current tech giants may also lead to beneficial economic effects. But breaking up the tech giants is not the only way to address concerns about their monopoly power. It is also possible to simply regulate the particular areas in their behaviour that may be harmful to the public interest.

## Formative Assessment

1. Which of the following are platform businesses?
  - a. Alibaba
  - b. Toyota
  - c. Standard Oil
  - d. US Steel
  - e. All of the above
  
2. Why are the costs of expanding a platform business smaller than those of expanding a linear business?
  - a. Platform businesses do not need to pay taxes.
  - b. Platform businesses are not required to pay wages to their workers.
  - c. Platform businesses do not seek to build, maintain, or control large inventories of physical products.
  - d. Platform businesses are exempted from environmental regulations.
  - e. All of the above
  
3. It is possible to start a successful online business without using any of the major tech platforms.
  - a. True.
  - b. False.
  
4. Senator John Sherman believed that the only goal of antitrust enforcement was to ensure lower prices for consumers.
  - a. True
  - b. False

5. Amazon markets its own products and brands on its own online marketplace. The third-party vendors operating on Amazon's online marketplace may view this as a form of unfair competition? Why is this so?
- a. It is illegal for a retail company to market its own products and brands in its own stores.
  - b. Amazon's actions have driven customers away from its online marketplace, hurting the sales of many third-party vendors.
  - c. Amazon's access to the data generated by the activity on its platform gives it a strong advantage in marketing its own goods and brands.
  - d. Amazon is exempted from consumer protection regulations. This allows it to produce cheap (but unsafe) products.
  - e. All of the above.

## Solutions or Suggested Answers

### Formative Assessment

1. Which of the following are platform businesses?
  - a. Alibaba  
**Correct! Alibaba bridges buyers and sellers or producers and consumers.**
  - b. Toyota  
Incorrect. Toyota is a linear business.
  - c. Standard Oil  
Incorrect. Standard Oil was a linear business.
  - d. US Steel  
Incorrect. US Steel is a linear business.
  - e. All of the above  
Incorrect. Option a is the only correct answer.
  
2. Why are the costs of expanding a platform business smaller than those of expanding a linear business?
  - a. Platform businesses do not need to pay taxes.  
Incorrect. All business have to pay their taxes.
  - b. Platform businesses are not required to pay wages to their workers.  
Incorrect. All businesses have to pay their workers.
  - c. Platform businesses do not seek to build, maintain, or control large inventories of physical products.  
**Correct! The tech platform is an asset-light business model.**
  - d. Platform businesses are exempted from environmental regulations.



Incorrect. Government regulations apply to all individuals and entities.

- e. All of the above

Incorrect. Option c is the only correct answer.

3. It is possible to start a successful online business without using any of the major tech platforms.

- a. True.

Incorrect.

- b. False.

**Correct! The major tech platforms are so powerful that they have become gatekeepers to the online world.**

4. Senator John Sherman believed that the only goal of antitrust enforcement was to ensure lower prices for consumers.

- a. True

Incorrect.

- b. False

**Correct! He also saw antitrust enforcement weapon for defending democracy against the threat posed by private power.**

5. Amazon markets its own products and brands on its own online marketplace. The third-party vendors operating on Amazon's online marketplace may view this as a form of unfair competition? Why is this so?

- a. It is illegal for a retail company to market its own products and brands in its own stores.

Incorrect. It is not unusual for a retail giant to market its own products and brands in its own stores.

- b. Amazon's actions have driven customers away from its online marketplace, hurting the sales of many third-party vendors.

Incorrect. It must be noted that the prices of Amazon's own products may be lower than the prices of the products sold by third-party vendors. Customers in search of a bargain may be drawn to Amazon's online marketplace to buy Amazon's cheap products.

- c. Amazon's access to the data generated by the activity on its platform gives it a strong advantage in marketing its own goods and brands.

**Correct! With access to the data generated by the activities of buyers and sellers on its platform, Amazon has an edge over third-party sellers in tactically marketing its own goods and brands.**

- d. Amazon is exempted from consumer protection regulations. This allows it to produce cheap (but unsafe) products.

Incorrect. Government regulations apply to all companies.

- e. All of the above.

Incorrect. Option c is the only correct answer.

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# Study Unit 2

## The Role of the State

## Learning Outcomes

By the end of this unit, you should be able to:

1. Explain why and how the Chinese government intervenes in the Chinese tech sector in order to shape and promote its growth and development.
2. Illustrate the role of the US government in promoting innovation and entrepreneurship.
3. Discuss the basic reasons for and against state intervention in the tech sector.



## Overview

This unit focuses on the role of the state in shaping and promoting the growth and development of the tech sector. It shows why and how the Chinese government intervenes in the Chinese tech sector in order to shape and promote its growth and development. It also shows that the United States, in spite of the pro-free market rhetoric of its politicians and other public figures, has in fact been operating a highly successful industrial policy for decades. The exact role that the state should play in the promotion of innovation and tech entrepreneurship is now a subject of ceaseless public debate. Should the state intervene heavily in order to build a vibrant tech sector? Or should the bulk of this task be left to the private sector? This unit will equip you with the knowledge to become an informed participant in this debate.



### Lesson Recording

[Study Unit 2 Lesson Recording](#)

## Chapter 1: The State and the Tech Sector (China)

### 1.1 Why Does the Chinese State Intervene in the Chinese Tech Sector?

The close relationship between the state and the tech sector in China has caused unease among some of China's major trading partners, particularly the United States and the EU. They fear that it may become hard to tell if they are doing business with private Chinese tech companies or the Chinese government.<sup>1</sup> In China, Communist Party committees have been implanted in many tech firms.<sup>2</sup> The Chinese state, in 2018, even proposed the idea of buying tiny stakes and acquiring board seats in the Chinese tech giants.<sup>3</sup> The strong role of the state can also be seen in China's start-up arena. There are over 1000 government-owned venture capital (VC) firms in China.<sup>4</sup> In the words of one commentator, China 'is on the verge of nationalizing' its tech sector.<sup>5</sup>

To a certain extent, we should not be surprised by the Chinese's government's assertion of control over the Chinese tech sector. China embarked on market reforms in 1978, but reform did not mean the complete removal of state control of and influence over the strategic sectors of the Chinese economy. Market reform did eventually lead to a fall in

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<sup>1</sup> Louise Lucas, 'The Chinese Communist Party entangles big tech', *The Financial Times*, 19 July 2019. Available online at <https://www.ft.com/content/5d0af3c4-846c-11e8-a29d-73e3d454535d> (Last accessed on 26 June 2019).

<sup>2</sup> Christopher Balding, 'In China, tech is now all but state-owned', *The Business Times* (This article originally appeared on Bloomberg), 12 April 2018. Available online at <https://www.businesstimes.com.sg/technology/in-china-tech-is-now-all-but-state-owned> (Last accessed on 29 June 2019).

<sup>3</sup> Ibid.

<sup>4</sup> Ibid.

<sup>5</sup> Ibid.

the state-owned enterprises' (SOEs) share of economic production.<sup>6</sup> But the Chinese state never gave up 'its monopoly or near-monopoly' in many strategic sectors.<sup>7</sup> As Pei Minxin has noted, continued state 'control over ... important sectors allows the government to have an ability to influence economic activities – and distort the market – that is perhaps far greater than its share of total economic output would indicate.'<sup>8</sup>

In 2008, as we saw in Study Unit 1, the top nine Chinese companies by market value were state businesses, mainly in finance and energy. A mere decade later, in 2018, the two largest Chinese companies by market value were Alibaba and Tencent, both of which were and remain private sector companies.<sup>9</sup> Moreover, China's tech giants – the famous BAT trio of Baidu, Alibaba, and Tencent – are major investors in the Chinese tech sector. Many Chinese unicorn companies – a privately held tech company with a valuation of at least US \$1 billion – have received investment from the BAT trio.<sup>10</sup> It may be said that the Chinese government is simply catching up with the times. The tech sector is now a major strategic sector and it should also fall under the authority of the state in some way.

But it is not only the long tradition of state control of and influence over strategic sectors that explains the Chinese government's push to impose its authority on the tech sector. We must also consider the impact of two events in the past decade: the global financial crisis of 2007-2008 and the rise of Xi Jinping. The financial crisis of 2007-2008 led to concerns about the stability of state-owned businesses and the unemployment that could result

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<sup>6</sup> Pei Minxin, *China's Trapped Transition: The Limits of Developmental Autocracy* (Harvard, 2006), p. 124.

<sup>7</sup> Ibid.

<sup>8</sup> Ibid.

<sup>9</sup> Louise Lucas, 'The Chinese Communist Party entangles big tech', *The Financial Times*, 19 July 2019. Available online at <https://www.ft.com/content/5d0af3c4-846c-11e8-a29d-73e3d454535d> (Last accessed on 26 June 2019).

<sup>10</sup> Christopher Balding, 'In China, tech is now all but state-owned', *The Business Times* (This article originally appeared on Bloomberg), 12 April 2018. Available online at <https://www.businesstimes.com.sg/technology/in-china-tech-is-now-all-but-state-owned> (Last accessed on 29 June 2019).

from their collapse.<sup>11</sup> The Chinese government responded with a large economic stimulus package. The stimulus scheme, however, heavily favoured SOEs; it seemed to be guided by the philosophy of *guojinmintui*, “the state advances as the private sector recedes”.<sup>12</sup>

According to Nicholas Lardy, the shift towards state planning and direction has intensified since Xi Jinping came to power in 2012. President Xi, Lardy explains, ‘has ... repeatedly emphasized the role of state industrial policy and state-owned companies’.<sup>13</sup> In 2015, the Chinese government announced ‘Made in China 2025’, an ambitious industrial policy for achieving Chinese dominance in many high-tech sectors, including robotics and artificial intelligence (AI)<sup>14</sup> Direct government financial support – ‘state funding, low interest loans, tax breaks, and other subsidies’ – forms a key component of the ‘Made in China 2025’ strategy.<sup>15</sup> President Xi has also vowed to nourish and strengthen state-owned firms, even though, according to Lardy, there is ‘overwhelming evidence that the latter are inefficient.’<sup>16</sup> Lardy believes that this policy will weaken China’s economic growth. But

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<sup>11</sup> Louise Lucas, ‘The Chinese Communist Party entangles big tech’, *The Financial Times*, 19 July 2019. Available online at <https://www.ft.com/content/5d0af3c4-846c-11e8-a29d-73e3d454535d> (Last accessed on 26 June 2019).

<sup>12</sup> Centre for International Private Enterprise (CIPE), ‘A stimulus package with Chinese characteristics: “the state advances as the private sector recedes”’, *Centre for International Private Enterprise* (Blog post on the CIPE’s website), 9 September 2009. Available online at <https://www.cipe.org/blog/2009/09/09/a-stimulus-package-with-chinese-characteristics-the-state-advances-as-the-private-sector-recedes/> (Last accessed on 29 June 2019).

<sup>13</sup> Nicholas R. Lardy, ‘Xi Jinping’s turn away from the market puts Chinese growth at risk’, *Peterson Institute for International Economics* (this article originally appeared on *The Financial Times*), 15 January 2019. Available online at <https://www.piie.com/commentary/op-eds/xi-jinpings-turn-away-market-puts-chinese-growth-risk> (Last accessed on 29 June 2019).

<sup>14</sup> James McBride and Andrew Chatzky, ‘Is “Made in China 2025” a threat to global trade?’, *Council on Foreign Relations*, 13 May 2019. Available online at <https://www.cfr.org/background/made-china-2025-threat-global-trade> (Last accessed on 29 June 2019).

<sup>15</sup> Ibid.

<sup>16</sup> Nicholas R. Lardy, ‘Xi Jinping’s turn away from the market puts Chinese growth at risk’, *Peterson Institute for International Economics* (this article originally appeared on *The Financial Times*),

he argues that it is probable that President Xi will tolerate this 'as the price of maintaining a state sector that he believes is an important element in sustaining political control.'<sup>17</sup> China's leadership, moreover, is concerned about the social instability that could result from the shutting down of weak SOEs. In addition to direct job losses, the broader web of small private companies that provide goods and services for the SOEs would also be severely affected.<sup>18</sup>

The important point to note is that the Chinese government's assertion of control over the Chinese tech sector has to be contextualized within the general assertion of state influence over the entire economy in the past decade or so. But state intervention, as we shall see, is not necessarily a threat to the strength and vitality of the Chinese tech sector.

## 1.2 The State and the Tech Sector Advance Together

There is no reason to believe that state intervention is incompatible with the needs of the Chinese tech sector and the Chinese tech giants. As the high-tech dreams of 'Made in China 2025' show, the state is throwing its vast resources behind the tech sector. For China's tech giants, cooperation with the state and compliance with its vision also leads to rewards. For giants like Alibaba and Tencent, cooperating with the state may reduce the chances that their monopoly power will be broken up.<sup>19</sup> Beijing, it must be noted, also secured the Chinese home market for local tech companies by banning major

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15 January 2019. Available online at <https://www.piie.com/commentary/op-eds/xi-jinpings-turn-away-market-puts-chinese-growth-risk> (Last accessed on 29 June 2019).

<sup>17</sup> Ibid.

<sup>18</sup> Cissy Zhou and Finbarr Bermingham, 'China steps up efforts to close failed zombie companies by 2020, but faces harsh economic reality', *South China Morning Post*, 7 February 2019. Available online at <https://www.scmp.com/economy/china-economy/article/2185186/china-steps-efforts-close-failed-zombie-companies-2020-faces> (Last accessed on 30 June 2019).

<sup>19</sup> Louise Lucas, 'The Chinese Communist Party entangles big tech', *The Financial Times*, 19 July 2019. Available online at <https://www.ft.com/content/5d0af3c4-846c-11e8-a29d-73e3d454535d> (Last accessed on 26 June 2019).

American tech companies like Facebook and Google.<sup>20</sup> Although the state has been trying to persuade tech companies to invest in state-owned enterprises in order to improve the latter's performance, the state itself is also a major investor in the tech sector.<sup>21</sup> Government-owned VC firms in China have over US\$750 billion at their disposal.<sup>22</sup> In any case, Beijing's determination to transform China into the world's leading AI and technological power is clearly aligned with the goals of the Chinese tech giants. In 2017, China's Ministry of Science and Technology enrolled Baidu, Alibaba, Tencent, and iFlyTek into the state's overall strategy for achieving breakthroughs in AI and vaulting China into a position of global leadership in technology.<sup>23</sup> The Chinese tech giants were already in a dominant position prior to this announcement. But there were still clear advantages to be gained from being officially designated as 'national champions'.<sup>24</sup> It would open the door, for example, to greater cooperation with other firms with the necessary resources and complementary assets – data, especially – for powering the tech giants' AI projects.<sup>25</sup>

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<sup>20</sup> Ibid.

<sup>21</sup> Ibid.; and Christopher Balding, 'In China, tech is now all but state-owned', *The Business Times* (This article originally appeared on *Bloomberg*), 12 April 2018. Available online at <https://www.businesstimes.com.sg/technology/in-china-tech-is-now-all-but-state-owned> (Last accessed on 29 June 2019).

<sup>22</sup> Christopher Balding, 'In China, tech is now all but state-owned', *The Business Times* (This article originally appeared on *Bloomberg*), 12 April 2018. Available online at <https://www.businesstimes.com.sg/technology/in-china-tech-is-now-all-but-state-owned> (Last accessed on 29 June 2019).

<sup>23</sup> Meng Jing and Sarah Dai, 'China recruits Baidu, Alibaba, and Tencent to AI "national team"', *South China Morning Post*, 25 September 2018. Available online at <https://www.scmp.com/tech/china-tech/article/2120913/china-recruits-baidu-alibaba-and-tencent-ai-national-team> (Last accessed on 29 June 2019).

<sup>24</sup> Ibid.

<sup>25</sup> Ibid.

It is clearly wrong to argue that state intervention and tech entrepreneurship will always be in conflict with each other. In 2015, China's State Council released a directive that proclaimed the need for an aggressive campaign to boost innovation and entrepreneurship. Local officials, knowing that their career prospects depended on fulfilling Beijing's demands, rushed to implement the directive's vision.<sup>26</sup> They disbursed a large variety of subsidies and incentives to lure start-ups into their localities.<sup>27</sup> This 'mass innovation campaign' led to significant results.<sup>28</sup> According to the Taiwanese venture capitalist Lee Kai-Fu, this 'flood of subsidies created 6,600 new startup incubators around the nation, more than quadrupling the overall total.'<sup>29</sup> Urban and regional officials also proved to be adept in using state funds (the 'guiding funds') to mobilize venture capital.<sup>30</sup> These officials would invest capital from the 'guiding fund' in private VC funds. To ensure discipline, this arrangement does not do away with the element of risk: if a particular private VC fund collapses because its portfolio of start-ups performs poorly, both the state and the private participants in the fund will lose their money. But if the fund performs well, the government's gains will be capped at a particular level and all gains in excess of this cap will be disbursed to the private participants in the fund.<sup>31</sup> 'Private investors', Lee Kai-Fu explains, 'are thus incentivized to follow the government's lead, investing in funds and industries that the local government wants to foster.'<sup>32</sup> From 2013 to 2015, the amount of 'guiding funds' mobilized increased from US\$7 billion to US\$27 billion.<sup>33</sup> Private VC funding also grew quickly within the same period: from US\$3 billion before 2014 to US

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<sup>26</sup> Lee Kai-Fu, *AI Superpowers: China, Silicon Valley, and the New World Order* (New York, 2018), pp. 63-64.

<sup>27</sup> *Ibid.*, p. 64.

<sup>28</sup> *Ibid.*, p. 63.

<sup>29</sup> *Ibid.*, p. 64.

<sup>30</sup> *Ibid.*

<sup>31</sup> *Ibid.*

<sup>32</sup> *Ibid.*

<sup>33</sup> *Ibid.*

\$26 billion by 2015.<sup>34</sup> Clearly, it is possible for the state and the private sector to advance together.

Lee Kai-Fu notes that pro-free market American commentators have traditionally disapproved of the aggressive nature of Chinese state intervention in the Chinese tech sector. These voices argue that private businesses tend to make smarter investment decisions and that the state should therefore take a back seat and allow the allocation of resources to be handled by the free market.<sup>35</sup> The Chinese government's goal, Lee Kai-Fu explains, is to sharply reduce the Chinese economy's traditional reliance on 'manufacturing-led growth' in favour of 'innovation-led growth'.<sup>36</sup> If left entirely to the free market, the accomplishment of this task, the Chinese government believes, 'would take many years, if not decades.'<sup>37</sup> The state therefore has to step in to speed up this process.<sup>38</sup>

China is not the only country in the world that operates an industrial policy. The United States, in spite of the free market rhetoric of many of its politicians, also has a long history of intervening in its economy to promote innovation and entrepreneurship.

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<sup>34</sup> Ibid., p. 65.

<sup>35</sup> Ibid.

<sup>36</sup> Ibid.

<sup>37</sup> Ibid.

<sup>38</sup> Ibid.



## Chapter 2: The State and the Tech Sector (The United States)

### 2.1 US Industrial Policy

The founding myths of many US tech giants are focused on the heroic garage entrepreneur. The stories of the rise of Google, Apple, Microsoft, and Amazon all begin with their founders taking their initial business steps in a garage.<sup>39</sup> The garage myth lionises the individual entrepreneur. There is no doubt that the growth of the tech giants was driven by ambitious and energetic founders. But the garage myth downplays the crucial role of state support. As we saw in Study Unit 1, the growth of the American tech giants was partly driven by a favourable antitrust environment. The American tech giants grew by acquiring many other firms, which they might not have been able to do if the government had objected to some of these acquisitions. We have also seen the role of the Chinese state in promoting innovation and entrepreneurship.

There are, in fact, many state agencies in the United States that have invested – and continue to invest – large sums in innovation. The Defense Advanced Research Projects Agency (DARPA), the National Science Foundation (NSF), and the National Institutes of Health (NIH) are three of the major state agencies responsible for funding innovation.

In 1957, the Soviet Union launched Sputnik, the world's first man-made Earth satellite. This technological achievement shocked the United States into action. In 1958, the US government established ARPA (later renamed DARPA) for the purpose of funding new technologies relevant to the country's defence needs. DARPA works closely

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<sup>39</sup> David Gann and Mark Dodgson, 'Forget the start-up garage myth. We need golden triangles and super clusters', *World Economic Forum* (This article appears on the World Economic Forum's website), 3 November 2016. Available online at <https://www.weforum.org/agenda/2016/11/the-startup-garage-myth/> (Last accessed on 1 July 2019).

with universities, private businesses, and other state bodies.<sup>40</sup> In 1969, ARPA created ARPANET, the forerunner (an early version) of today's internet. 'Without ARPA,' notes the journalist Ben Tarnoff, 'the internet would not exist.'<sup>41</sup> The foundations of the internet revolution were financed by the US government. Government funding largely originates from tax revenue. In other words, ordinary citizens are the invisible contributors to innovation.

The NSF was established in 1950. It focuses on general scientific research (with the exception of the medical sciences).<sup>42</sup> The origins of Google's famous search algorithm can be traced to NSF funding.<sup>43</sup> The NIH, as its name suggests, promotes research in the health and medical sciences.<sup>44</sup> The Small Business Innovation Research (SBIR) programme is another crucial public source of funding.<sup>45</sup> The SBIR, Mariana Mazzucato points out, 'offers high-risk financing to companies at much earlier stages than most private venture capital firms do'.<sup>46</sup>

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<sup>40</sup> The basic information on DARPA is taken from the 'About DARPA' page on DARPA's official website [Available online at <https://www.darpa.mil/about-us/about-darpa> (Last accessed on 30 June 2019)] and Duncan Graham-Rowe, 'Fifty years of DARPA: A surprising history', *New Scientist*, 15 May 2008 [Available online at <https://www.newscientist.com/article/dn13908-fifty-years-of-darpa-a-surprising-history/> (Last accessed on 30 June 2019)].

<sup>41</sup> Ben Tarnoff, 'How the internet was invented', *The Guardian*, 15 July 2016. Available online at <https://www.theguardian.com/technology/2016/jul/15/how-the-internet-was-invented-1976-arpa-kahn-cerf> (Last accessed on 30 June 2019).

<sup>42</sup> The basic information on the NSF is taken from the 'About NSF' page on the NSF's official website [Available online at <https://www.nsf.gov/about/> (Last accessed on 30 June 2019)].

<sup>43</sup> Mariana Mazzucato, 'The Innovative State: Governments should Make Markets, not just Fix them', *Foreign Affairs* 94 (2015), p. 66.

<sup>44</sup> The basic information on the NIH is taken from the 'Mission and Goals' page on the NIH's official website [Available online at <https://www.nih.gov/about-nih/what-we-do/mission-goals> (Last accessed on 30 June 2019)].

<sup>45</sup> Mazzucato, 'The Innovative State', pp. 65-66.

<sup>46</sup> *Ibid.*, p. 66.

The United States' tradition of state intervention goes all the way back to the nineteenth century, when it relied on high tariff barriers to protect and encourage the growth of infant industries.<sup>47</sup> Indeed, China has pushed back against foreign critics of its interventionist economic policies by arguing that it is simply relying on the same development tactics that the current rich nations were using when they were poor and underdeveloped.<sup>48</sup>

State support is a crucial factor in the promotion of innovation and entrepreneurship. This is because it is highly unlikely that private venture capital would be willing to finance high-risk early stage research. Mariana Mazzucato warns that 'venture capital firms have become more short term in their outlook, emphasizing finding an "exit" for each of their investments ... within three years.'<sup>49</sup> 'Real innovation', she stresses, 'can take decades.'<sup>50</sup> The internet revolution is an excellent case in point. Tech entrepreneurship is often associated with speed, decisiveness, and boldness.<sup>51</sup> But we cannot ignore the fact that the true internet revolution was, in fact, a slow and gradual march. The ARPANET was created in 1969. Decades of research and development, the key stages of which were linked to state funding, preceded the internet revolution and the rise of the tech giants. The state clearly has a crucial role to play in fostering innovation. The history of innovation, Mariana Mazzucato argues, shows that the state is 'often ... more daring' than the private sector, 'willing to take risks that businesses won't' and to supply funding 'that the private sector has been too scared to provide.'<sup>52</sup> The state, therefore, should not take a back seat

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<sup>47</sup> For a brief history of US protectionist policies, see Ha-Joon Chang, *Bad Samaritans: The Guilty Secrets of the Rich Nations and the Threat to Global Prosperity* (London, 2007), pp. 48-56.

<sup>48</sup> James McBride and Andrew Chatzky, 'Is "Made in China 2025" a threat to global trade?', *Council on Foreign Relations*, 13 May 2019. Available online at <https://www.cfr.org/backgrounders/made-china-2025-threat-global-trade> (Last accessed on 29 June 2019).

<sup>49</sup> Mazzucato, 'The Innovative State', p. 66.

<sup>50</sup> Ibid.

<sup>51</sup> See, for example, Taylor Pearson, 'Creative destruction: Move fast and break things', *Entrepreneur* (Asia Pacific), 29 November 2016. Available online at <https://www.entrepreneur.com/article/284609> (Last accessed on 30 June 2019).

<sup>52</sup> Mazzucato, 'The Innovative State', p. 61.

in the promotion of innovation and entrepreneurship but should instead aim to 'lead ... by actively creating markets.'<sup>53</sup>

Mariana Mazzucato uses Apple's iPhone to illustrate the critical role of the state in promoting innovation. She notes that the major components and features of the iPhone can be traced to state funding.<sup>54</sup> As shown above, the origins of the internet can be traced to DARPA. GPS (Global Positioning System) started out as a military initiative in the 1970s.<sup>55</sup> The origins of the iPhone's touchscreen can be linked to several sources of public funding, including the NSF and the CIA (Central Intelligence Agency).<sup>56</sup> SIRI owes her existence to a DARPA AI project.<sup>57</sup> Apple deserves credit for integrating these technologies into a marketable and popular product, but the 'public side of the story' should not be ignored.<sup>58</sup>

Early stage research, however, is not the only risky phase in the journey towards a successful tech product. According to Stian Westlake, the Executive Director of Policy and Research at Nesta (an innovation organization based in the UK), Mazzucato's Apple case study underestimates the challenge of combining different technologies into a marketable product. 'Anyone who doubts', he stresses, 'that commercializing smartphone technologies was *difficult* should try using a pre-iPhone smartphone.'<sup>59</sup> It is true that developing new technologies is incredibly risky; but so is the task of putting together several technologies in the pursuit of a successful consumer product. For example, Apple's rivals also had access to the same range of state-funded technologies. But they failed

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<sup>53</sup> Ibid., pp. 62-63.

<sup>54</sup> Ibid., p. 64.

<sup>55</sup> Ibid.

<sup>56</sup> Ibid.

<sup>57</sup> Ibid.

<sup>58</sup> Ibid.

<sup>59</sup> Stian Westlake, 'Interrogating the entrepreneurial state', *The Guardian*, 11 November 2014. Available online at <https://www.theguardian.com/science/political-science/2014/nov/11/interrogating-the-entrepreneurial-state-innovation-policy> (Last accessed on 1 July 2019).

to come up with an equally innovative and competitive product. The stakes are high; mistakes may lead to heavy defeats, as shown by the fates of Nokia, RIM (the company that created BlackBerry), and Motorola.<sup>60</sup>

Westlake further notes that Mazzucato's Apple case study pays insufficient attention to the importance of 'intangible investments' like 'design, new business models, marketing and software development'.<sup>61</sup> Innovations in these areas are as important to the goal of building a successful business as research in new technologies. Businesses spend a great deal – indeed, risk a great deal – on these 'intangible investments'.<sup>62</sup> It may be said that the pursuit of tech supremacy requires both sides – the state and the private sector – to be equally ambitious, energetic, and entrepreneurial.



### Activity 1

Find out more about 'Made in China 2025'. Why did the Chinese government come up with this initiative? What policies and tools will they use to implement it? What was the response of the international community, particularly the United States, to 'Made in China 2025'? Use Google Scholar and JSTOR for locating relevant peer-reviewed academic sources for this exercise and share your findings with your classmates on Google Docs.



### Read

McBride, James and Chatzky, Andrew, 'Is "Made in China 2025" a threat to global trade?', *Council on Foreign Relations*, 13 May 2019. Available online at <https://>

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<sup>60</sup> Ibid.

<sup>61</sup> Ibid.

<sup>62</sup> Ibid.

[www.cfr.org/backgrounders/made-china-2025-threat-global-trade](http://www.cfr.org/backgrounders/made-china-2025-threat-global-trade) (Last accessed on 29 June 2019).

## Summary

The Chinese government intervenes in its tech sector with a variety of tools and strategies. It has implanted Communist Party committees in many tech firms; it has invested directly in the tech sector; it has banned foreign competition in the Chinese home market; and it has provided many forms of financial support to tech firms. It intervenes in its tech sector because it has always sought control of and influence over strategic sectors in its economy. Moreover, over the past decade or so, from the global financial crisis of 2007-2008 to the rise of Xi Jinping, the Chinese state has shown more favour to state economic planning as means of preserving social stability and political control.

This unit has also shown that the United States, in spite of the pro-free market rhetoric of its politicians and other public figures, has in fact been operating a highly successful industrial policy for decades. There are many state research agencies in the United States – DARPA, the NSF, and the NIH – that provide funding for innovation. We have also seen that the state has to play a key role in promoting innovation and entrepreneurship because the private sector may not be willing to finance high-risk early stage research.

## Formative Assessment

1. The international community is not disturbed by the close relationship between the Chinese government and the Chinese tech sector.
  - a. True.
  - b. False.
  
2. Which of the following arguments has been used by the Chinese government to defend its interventionist economic policies against foreign criticism?
  - a. China is simply relying on the same development tactics that the current rich nations were using when they were poor and underdeveloped.
  - b. These policies are aimed at weakening American military power.
  - c. These policies are aimed at aimed at weakening Japanese military power.
  - d. These policies will lead to a new golden age of Chinese imperialism.
  - e. All of the above.
  
3. Why does China's current leadership support the policy of strengthening state-owned firms?
  - a. China's private sector is small, weak, and backward. It is not strong enough to promote economic growth and modernisation. State-owned firms are the country's only hope.
  - b. They believe that this policy will help them to maintain political control and social stability.
  - c. They were advised by the Americans to do so.
  - d. They were advised by the EU to do so.
  - e. All of the above.
  
4. Why do pro-free market American commentators disapprove of the Chinese government's policy of intervening aggressively in its tech sector?



- a. They believe that the Chinese state's entrepreneurial skills are so powerful that private Chinese entrepreneurs will not be able to survive. In the interests of fair competition, the Chinese state should refrain from intervening in the tech sector.
  - b. They believe that intervening in the tech sector will distract the Chinese government from its other domestic duties, like maintaining law and order and responding to natural disasters.
  - c. They believe that intervening in the tech sector will distract the Chinese government from its international duties, like finding a solution to the US-China trade war.
  - d. They believe that private businesses make smarter investment decisions than the state. The allocation of resources in the economy should therefore be handled by the free market.
  - e. All of the above.
5. China is the only country in the world that intervenes in its economy to promote innovation and entrepreneurship.
- a. True
  - b. False

## Solutions or Suggested Answers

### Formative Assessment

1. The international community is not disturbed by the close relationship between the Chinese government and the Chinese tech sector.

a. True.

Incorrect.

b. False.

**Correct ! The close relationship between the state and the tech sector in China has caused unease among some of China's major trading partners, particularly the United States and the EU. They fear that it may become hard to tell if they are doing business with private Chinese tech companies or the Chinese government.**

2. Which of the following arguments has been used by the Chinese government to defend its interventionist economic policies against foreign criticism?

a. China is simply relying on the same development tactics that the current rich nations were using when they were poor and underdeveloped.

**Correct! The United States, for example, relied heavily on tariffs in the nineteenth century to promote economic and industrial growth.**

b. These policies are aimed at weakening American military power.

Incorrect.

c. These policies are aimed at aimed at weakening Japanese military power.

Incorrect.

d. These policies will lead to a new golden age of Chinese imperialism.

Incorrect.

- e. All of the above.

Incorrect. Option a is the only correct answer.

3. Why does China's current leadership support the policy of strengthening state-owned firms?

- a. China's private sector is small, weak, and backward. It is not strong enough to promote economic growth and modernisation. State-owned firms are the country's only hope.

Incorrect. It is ridiculous to claim that China's private sector is small, weak and backward.

- b. They believe that this policy will help them to maintain political control and social stability.

**Correct! As shown in this study unit, Nicholas Lardy has suggested that President Xi is intent on strengthening the state-owned firms because he views them as a crucial tool in maintaining political authority. China's leadership also fears that the shutting down of the state-owned firms will lead to unemployment and social instability.**

- c. They were advised by the Americans to do so.

Incorrect.

- d. They were advised by the EU to do so.

Incorrect.

- e. All of the above.

Incorrect. Option b is the only correct answer.

4. Why do pro-free market American commentators disapprove of the Chinese government's policy of intervening aggressively in its tech sector?

- a. They believe that the Chinese state's entrepreneurial skills are so powerful that private Chinese entrepreneurs will not be able to survive. In the interests

of fair competition, the Chinese state should refrain from intervening in the tech sector.

Incorrect. They certainly do not believe that the Chinese state possesses entrepreneurial skills that are superior to those of the private sector.

- b. They believe that intervening in the tech sector will distract the Chinese government from its other domestic duties, like maintaining law and order and responding to natural disasters.

Incorrect.

- c. They believe that intervening in the tech sector will distract the Chinese government from its international duties, like finding a solution to the US-China trade war.

Incorrect.

- d. They believe that private businesses make smarter investment decisions than the state. The allocation of resources in the economy should therefore be handled by the free market.

**Correct! Pro-free market voices in the United States doubt the state's ability to make intelligent investment/business decisions. Such decisions, they argue, should be left to the private sector.**

- e. All of the above.

Incorrect. Option d is the only correct answer.

5. China is the only country in the world that intervenes in its economy to promote innovation and entrepreneurship.

- a. True

Incorrect.

- b. False

**Correct! The United States also intervenes in its economy to promote innovation and entrepreneurship.**

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# Study Unit 3

## The Social and Political Impact of the Rise of the Tech Giants

## Learning Outcomes

By the end of this unit, you should be able to:

1. Explain why AI may not always make impartial judgements and decisions.
2. Explain why the rise of the major tech platforms has made it easier for malicious actors to spread fake news and other forms of harmful content.
3. Illustrate the optimistic and pessimistic perspectives on the impact of automation on the future of employment.
4. Define 'surveillance capitalism' correctly (this term is attributed to Shoshana Zuboff; see main text for citations).
5. Discuss the impact of Big Data on the American and Chinese political systems.
6. Examine the ways in which Big Data tools are deployed by the Chinese tech giants.

## Overview

In this unit, we will focus on the social and political implications of the rise of the tech giants. In particular, we will examine how the products, platforms, and services provided by the tech giants strengthen or weaken social stability and the authority and legitimacy of state and political institutions. We will examine how AI may worsen racial and gender inequalities; how the major tech platforms make it easier for malicious actors to spread fake news and other forms of harmful content; the impact of automation on the future of work; the dangers of surveillance capitalism; and the impact of Big Data on the American and Chinese political systems.



### **Lesson Recording**

[Study Unit 3 Lesson Recording](#)

## Chapter 1: Social Stability in the Age of the Tech Giants

### 1.1 Technology: Made in Our Image

The products, tools, and services offered by the tech giants may threaten social stability by worsening racial and gender inequalities. This is due to a simple reason: technology is made in our image. Technology often reflects and reinforces our biases and prejudices.

In an article for *The Conversation*, Jonathan Cohn, a professor of digital cultures, argues that Google's algorithms produce biased and potentially offensive results. He points out that when he searches for images of 'woman' or 'girl', 'the vast majority of results are pictures of thin white women'.<sup>1</sup> Moreover, the options put forward by Google for narrowing down the results – 'attractive', 'skinny', and 'pregnant' – are also biased and offensive.<sup>2</sup> When Cohn's students repeated this simple experiment for Asian women and Latinas, 'sexualized' results were produced. 'The student's informal search results', Cohn reports, 'featured scantily clad women — and seemed to do so much more than their white counterparts.'<sup>3</sup>

Why do Google's algorithms produce biased and offensive results? 'Stereotyping', according to Cohn, occurs in Google's search results because it is a platform 'that aims to replicate how humans already sort information.'<sup>4</sup>

This point – 'aims to replicate how humans already sort information' – is crucial to understanding how technology preserves and may worsen racial and gender inequalities. Machine learning algorithms sweep through vast quantities of data to identify patterns

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<sup>1</sup> Jonathan Cohn, 'Google's algorithms discriminate against women and people of colour', *The Conversation*, 25 April 2019. Available online at <https://theconversation.com/googles-algorithms-discriminate-against-women-and-people-of-colour-112516> (Last accessed on 1 July 2019).

<sup>2</sup> Ibid.

<sup>3</sup> Ibid.

<sup>4</sup> Ibid.

and to make predictions. But these algorithms are not neutral and impartial. *This is because they are trained on human and real-world data.*<sup>5</sup> Humans are biased creatures; their online and real-world actions and decisions will generate data that reflect their biases. The world is an unequal place; it generates data that reflect these inequalities.

In short, AI programmes, as the journalist Brian Resnick explains, ‘learn by looking at the world as the way it is, not as it ought to be.’<sup>6</sup> If we fail to understand this, we may end up designing and deploying AI programmes that strengthen our biases and worsen existing inequalities.<sup>7</sup>

Resnick points his readers to several case studies. AI is now used in hiring decisions. If we feed data, for example, that show that most computer programmers are men and that most nurses are women into a recruitment company’s machine learning programme, it may ignore female applicants for computer programming positions and male applicants for nursing positions.<sup>8</sup> But this has nothing to do with the actual capabilities of the individual applicants. AI is also being used in healthcare to help doctors to make treatment decisions. Women, Resnick notes, tend to ‘get surgery at lower rates than men’.<sup>9</sup> This could reflect the fact that women are often ‘primary caregivers’ and may have trouble finding someone at home to provide post-operative care.<sup>10</sup> But would an AI tool be able to understand this? What if it proposes, based on the historical data, that women should go for surgery on a less frequent basis than men?<sup>11</sup> In the United States, the criminal justice system now uses a machine learning programme to predict crime. The programme has suggested

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<sup>5</sup> Brian Resnick, ‘Yes, artificial intelligence can be racist’, *Vox*, 24 January 2019. Available online at <https://www.vox.com/science-and-health/2019/1/23/18194717/alexandria-ocasio-cortez-ai-bias> (Last accessed on 23 June 2019).

<sup>6</sup> *Ibid.*

<sup>7</sup> *Ibid.*

<sup>8</sup> *Ibid.*

<sup>9</sup> *Ibid.*

<sup>10</sup> *Ibid.*

<sup>11</sup> *Ibid.*

that African-Americans are more likely to commit crimes than White Americans. But this, according to Resnick, merely reflects the fact that the American justice system has 'historically ... been unfair to black Americans.'<sup>12</sup>

The tech giants are responsible for designing and deploying many of the AI tools that have shaped – and will continue to shape – your lives. As a consumer and a participant in the debates on the impact of these tools, you would do well to remember Resnick's conclusion: '*AI learns about how the world has been. It picks up on status quo trends. It doesn't know how the world ought to be. That's up to humans to decide.*'<sup>13</sup>

## 1.2 The Online Spread of Fake News and Harmful Content

All over the world, governments are debating and devising solutions to deal with the spread of fake news and harmful content (e.g. hate speech and extremist content) through online avenues, particularly social media.

The threat posed by misinformation to social and political stability is not new. But it is now easier to spread false and harmful content because of the products, services, and platforms offered by the tech giants. Why is this the case? It is, of course, extremely easy to create a piece of fake news or extremist content and to post it online. But we must also take into account the fact, as the journalist Katherine Viner notes, that the social media platforms are 'designed to maximise your time within their walls'.<sup>14</sup> Facebook's algorithms 'are designed to give us more of what they think we want'.<sup>15</sup> This means that

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<sup>12</sup> Ibid.

<sup>13</sup> Ibid. Emphasis added.

<sup>14</sup> Katherine Viner, 'How technology disrupted the truth', *The Guardian*, 12 July 2016. Available online at <https://www.theguardian.com/media/2016/jul/12/how-technology-disrupted-the-truth> (Last accessed on 23 June 2019).

<sup>15</sup> Ibid.

Facebook recommends content to its users that ‘has been invisibly curated to reinforce our pre-existing beliefs.’<sup>16</sup>

But what if a particular user has a history of consuming fake news? Recommendations based on the user’s history of fake news consumption may not lead the user to content that could persuade him to question his incorrect views.<sup>17</sup> What if the user is an aspiring terrorist or a Nazi? It is in the public interest to expose such a user to content that would persuade him to question his beliefs. Instead, a social media platform that is designed to increase user engagement may recommend him content that could radicalise him. As the journalist Ainur Rohmah has shown, this is how radical content spreads through Indonesia via Facebook. Facebook, ‘by applying algorithms intended to connect users to content they may find interesting based on previous behaviour on the site’, unintentionally ‘recommends other radical links on these pages to users.’<sup>18</sup>

Facebook is actively working to curb the spread of fake news on its platform.<sup>19</sup> It also recognizes the importance of fighting the spread of extremist content, as demonstrated by its decision to ban white nationalist content on its platforms.<sup>20</sup> But Facebook’s business model, for now, is still based on farming data from its users and marketing them to advertisers. As Belinda Barnet notes, Facebook’s real customers are advertisers rather than

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<sup>16</sup> Ibid.

<sup>17</sup> Ibid.

<sup>18</sup> Ainur Rohmah, ‘How social media helps spread extremist content in Indonesia, and what’s being done about it’, *South China Morning Post*, 20 January 2019. Available online at <https://www.scmp.com/lifestyle/article/2182643/how-social-media-helps-spread-extremist-content-indonesia-and-whats-being> (Last accessed on 23 June 2019).

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<sup>20</sup> Lois Beckett, ‘Facebook to ban white nationalism and separatism content’, *The Guardian*, 27 March 2019. Available online at <https://www.theguardian.com/technology/2019/mar/27/facebook-white-nationalism-hate-speech-ban> (Last accessed on 1 July 2019).

its users.<sup>21</sup> In other words, Facebook's profits still depend on increasing user engagement in order to collect more data from its users. It is still too early to tell if Facebook will be able to strike a balance between its business model and the need to serve the public interest.

### 1.3 Automation and Unemployment

We are living in a new age of automation. Anxious observers note that the growing use of AI and robotics will lead to massive job losses across many different industries.<sup>22</sup> The rise of AI, the journalist Larry Elliot warns, could lead to the 'hollowing out of the middle class'<sup>23</sup> '[M]achines', he notes, 'can replace radiologists, lawyers and journalists just as they have already replaced bank cashiers and will soon be replacing lorry drivers.'<sup>24</sup> This will widen the gap between the rich and the poor, leading to social and political instability.<sup>25</sup> Elon Musk, who leads Tesla and SpaceX, believes that the impact of automation on employment will be so severe that future governments may have to introduce universal basic income (UBI) schemes to support the unemployed.<sup>26</sup> Under

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<sup>21</sup> Belinda Barnet, 'Facebook is now cleaner, faster, and group-focused, but still all about your data', *The Conversation*, 4 June 2019. Available online at <https://theconversation.com/facebook-is-now-cleaner-faster-and-group-focused-but-still-all-about-your-data-118048> (Last accessed on 23 June 2019).

<sup>22</sup> See, for example, Martin Ford, *The Rise of the Robots: Technology and the Threat of a Jobless Future* (New York, 2015).

<sup>23</sup> Larry Elliot, 'Robots will not lead to fewer jobs – but the hollowing out of the middle class', *The Guardian*, 20 August 2017. Available online at <https://www.theguardian.com/business/2017/aug/20/robots-are-not-destroying-jobs-but-they-are-hollow-out-the-middle-class> (Last accessed on 22 June 2019).

<sup>24</sup> Larry Elliot, 'Robots will take our jobs. We had better plan now, before it's too late', *The Guardian*, 1 Feb 2018. Available online at <https://www.theguardian.com/commentisfree/2018/feb/01/robots-take-our-jobs-amazon-go-seattle> (Last accessed on 22 June 2019).

<sup>25</sup> Philip Perry, '47% of jobs will vanish in the next 25 years, says Oxford University researchers', *Big Think*, 24 December 2016. Available online at <https://bigthink.com/philip-perry/47-of-jobs-in-the-next-25-years-will-disappear-according-to-oxford-university> (Last accessed on 23 June 2019).

<sup>26</sup> Henry J. Holzer, 'Will robots make job training (and workers) obsolete? Workforce development in an automating labor market', *Brookings*, 19 June 2017.



a UBI scheme, the government makes payments to everyone, even if the recipient is unemployed.<sup>27</sup>

The debate on the impact of automation on employment has produced both optimistic and pessimistic views. The optimists' overall argument is that automation will *both* destroy and create jobs and that the new jobs created will make up for the jobs that are destroyed. The pessimists, in contrast, argue that job losses will vastly exceed gains.<sup>28</sup>

The optimists often point out that history shows that the rise of new technologies will not lead to massive unemployment.<sup>29</sup> The world has confronted the challenge of automation and labour-saving technologies many times throughout history. The introduction of new technologies that threaten to eliminate large numbers of jobs always leads to fear and anxiety. During the industrial revolution in nineteenth-century Britain, workers feared that they would be replaced by machines. In the early nineteenth century, angry workers – the 'Luddites' – destroyed textile machinery in response to economic difficulties.<sup>30</sup> In the 1960s, the dangers posed by automation to employment were widely discussed in the United States. The economist Robert Heilbroner warned that even basic office and

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Available online at <https://www.brookings.edu/research/will-robots-make-job-training-and-workers-obsolete-workforce-development-in-an-automating-labor-market/> (Last accessed on 1 July 2019).

<sup>27</sup> For an explanation of UBI, see Kelsey Piper, 'The important questions about universal basic income haven't been answered yet', *Vox*, 13 February 2019. Available online at <https://www.vox.com/future-perfect/2019/2/13/18220838/universal-basic-income-ubi-nber-study> (Last accessed on 30 June 2019).

<sup>28</sup> Henry J. Holzer, 'Will robots make job training (and workers) obsolete? Workforce development in an automating labor market', *Brookings*, 19 June 2017. Available online at <https://www.brookings.edu/research/will-robots-make-job-training-and-workers-obsolete-workforce-development-in-an-automating-labor-market/> (Last accessed on 1 July 2019).

<sup>29</sup> *Ibid.*

<sup>30</sup> Richard Conniff, 'What the Luddites really fought against', *Smithsonian Magazine*, March 2011. Available online at <https://www.smithsonianmag.com/history/what-the-luddites-really-fought-against-264412/?all> (Last accessed on 22 June 2019).

administrative skills were no longer safe from the disruptive impact of technology. Human workers, he argued, could become obsolete.<sup>31</sup> The economist Robert Theobald, as well as other commentators and public figures, argued that it would be necessary to introduce a UBI scheme to deal with the challenge of automation.<sup>32</sup>

In spite of these fears, heavy unemployment never resulted as a result of the emergence of new technologies. Therefore, according to the optimists, there is no reason to expect the new technologies of the present to result in severe job losses. The introduction of new technologies will boost productivity, leading to cheaper products. This should lead to greater demand for these products, which in turn creates greater demand for the workers involved in the creation of these products.<sup>33</sup> Amazon, according to the journalist Sarah Kessler, seems to confirm the optimistic view. By 2016, Amazon had 45,000 robots working in its warehouses.<sup>34</sup> But the growing deployment of robots in its warehouses has been accompanied by steady growth in its employee headcount. This could mean that the lower prices made possible by Amazon's investment in automation eventually led to greater demand, which in turn made it necessary for Amazon to increase its employee headcount.<sup>35</sup>

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<sup>31</sup> Daniel Akst, 'What can we learn from past anxiety over automation', *The Wilson Quarterly*, Summer 2013. Available online at <https://wilsonquarterly.com/quarterly/summer-2014-where-have-all-the-jobs-gone/theres-much-learn-from-past-anxiety-over-automation/> (Last accessed on 22 June 2019).

<sup>32</sup> Delphine D'Amora, 'A brief history of the idea that everyone should get free cash for life', *Mother Jones*, 26 December 2016. Available online at <https://www.motherjones.com/politics/2016/12/brief-history-income-inequality-minimum-wage/> (Last accessed on 22 June 2019).

<sup>33</sup> Sarah Kessler, 'The optimist's guide to the robot apocalypse', *Quartz*, 9 March 2018. Available online at <https://qz.com/904285/the-optimists-guide-to-the-robot-apocalypse/> (Last accessed on 22 June 2019).

<sup>34</sup> Ibid.

<sup>35</sup> Ibid.

The additional profits created by automation could also lead to higher wages for workers. This would boost consumption, which in turn leads to even more production.<sup>36</sup> But this will only work if the higher profits resulting from automation are indeed shared with workers in the form of higher wages. There is no reason to expect employers to do this of their own accord. The optimists, however, are confident that wages will rise. Furthermore, even if wages do not rise, workers will still benefit due to lower prices. As Kessler explains, 'if companies can make more money with the same number of workers, they can theoretically pay those workers better. If the price of goods drop, those workers can buy more without a raise.'<sup>37</sup>

The optimists also believe that automation and technological progress will create entirely new categories of jobs, though it is hard to predict the types of work that will emerge.<sup>38</sup> Technological progress, moreover, rarely results in the automation of entire jobs. New technologies often lead to the automation of only one aspect of a particular job, allowing the worker to keep his or her job and to focus even more on the other non-automated aspects of the job. This is why Amazon does not fire its warehouse workers whenever new warehouse robots are introduced.<sup>39</sup>

The pessimists, in contrast, argue that history may not repeat itself. They do not deny that the emergence of new technologies in the past did not lead to massive unemployment. But their main fear is that the rise of AI is fundamentally different from previous technological trends. The rise of AI, according to the pessimists, is not merely leading to the automation of repetitive tasks; it is also leading to the automation of learning and understanding.<sup>40</sup> Many classes of work could be swept away by the rise of AI, leading to a situation where

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<sup>36</sup> Ibid.

<sup>37</sup> Ibid.

<sup>38</sup> Ibid.

<sup>39</sup> Ibid.

<sup>40</sup> Gary Grossman, 'It's time for workers to worry about AI', *VentureBeat*, 7 April 2019. Available online at <https://venturebeat.com/2019/04/07/its-time-for-workers-to-worry-about-ai/> (Last accessed on 22 June 2019).

job losses will exceed gains. The pessimistic prediction suggests a future in which it will be possible, as the journalist Ben Tarnoff notes, 'to create more wealth *without* labor.'<sup>41</sup> This will deepen income inequality, which is, as of now, already a serious global problem.<sup>42</sup>

It is hard to tell where the future will lead us but we should not completely reject the pessimistic perspective on the impact of automation. Even now, there is some evidence to suggest that job losses could exceed job gains. As shown above, Amazon has continued to increase its employee headcount even though it has also been rapidly expanding the size of its robot workforce. But we must also pay attention to industry-wide trends in employment. Amazon is a mighty tech giant that is disrupting the entire retail industry. In other words, it is creating unemployment elsewhere in the retail industry. The key question is whether or not the growth in Amazon's employee headcount will be able to outweigh job losses elsewhere in the retail industry. According to Dave Edwards and Helen Edwards, the current data seem to indicate that the growth of employment at Amazon will not be able to make up for industry-wide job losses.<sup>43</sup>

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<sup>41</sup> Ben Tarnoff, 'Robots won't just take our jobs – they'll make the rich even richer', *The Guardian*, 2 March 2017. Available online at <https://www.theguardian.com/technology/2017/mar/02/robot-tax-job-elimination-livable-wage> (Last accessed on 1 July 2019). Emphasis supplied.

<sup>42</sup> Ibid.

<sup>43</sup> Dave Edwards and Helen Edwards, 'There are 170,000 fewer retail jobs in 2017 – and 75,000 more Amazon robots', *Quartz*, 4 December 2017. Available online at <https://qz.com/1107112/there-are-170000-fewer-retail-jobs-in-2017-and-75000-more-amazon-robots/> (Last accessed on 22 June 2019).

## Chapter 2: State Institutions in the Age of the Tech Giants

### 2.1 Surveillance Capitalism and the Surveillance State

The platforms offered by the tech giants will shape the future of the political systems and institutions of many countries. During the Arab Spring protests of 2011, angry protestors toppled or threatened to topple authoritarian governments across the Middle East. These protestors used major tech platforms like Facebook and YouTube to organize their uprisings and to promote their cause. This led many commentators to conclude that the rise of the tech giants would help to strengthen and promote democracy. Social media, in particular, would enable oppressed citizens to work around state censorship and organize resistance against dictatorial governments.<sup>44</sup>

This optimism has vanished over the past few years. Instead, it is now feared that social media is a threat to democracy. Authoritarian groups within established democracies have been able to boost their popularity through the tactical exploitation of social media. As the journalist Zack Beauchamp explains, social media provides these anti-democratic elements with a powerful tool for ‘spreading falsehoods about their opponents, ginning up panics about minority groups, and undermining people’s trust in the independent media.’<sup>45</sup>

The tech giants’ business model, known as ‘surveillance capitalism’, is also now regarded as a potential threat to democracy. Surveillance capitalism refers to the collection and monetisation of users’ data. Facebook offers us a clear example of surveillance capitalism. As explained earlier, Facebook collects data on its users and markets them to advertisers.

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<sup>44</sup> Zack Beauchamp, ‘Social Media is rotting democracy from within’, *Vox*, 22 January 2019. Available online at <https://www.vox.com/policy-and-politics/2019/1/22/18177076/social-media-facebook-far-right-authoritarian-populism> (Last accessed on 23 June 2019).

<sup>45</sup> *Ibid.*

According to Shoshana Zuboff, who created the term 'surveillance capitalism', this new form of capitalism differs from traditional capitalism in one key respect: it does not depend 'on people as consumers'. 'Instead,' Zuboff explains, 'supply and demand orients the surveillance capitalist firm to businesses intent on anticipating the behaviour of populations, groups and individuals.'<sup>46</sup>

The Cambridge Analytica scandal threw a harsh spotlight on these business practices. Cambridge Analytica was a political consulting company that worked for the Trump campaign during the 2016 US presidential election. It managed to get its hands on the data of 87 million Facebook users.<sup>47</sup> It then used the data to execute a highly sophisticated political advertising campaign<sup>48</sup> The Cambridge Analytica scandal, according to Chase Johnson, shows that powerful tech monopolies could threaten democracy by using their data for political purposes.<sup>49</sup> To understand the scale of this threat, we must bear in mind that we are living in the age of Big Data. As shown in Study Unit 1, as early as a decade

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<sup>46</sup> Quoted in John Naughton's interview of Shoshana Zuboff in John Naughton, "'The goal is to automate us": welcome to the age of surveillance capitalism', *The Guardian*, 20 January 2019. Available online at <https://www.theguardian.com/technology/2019/jan/20/shoshana-zuboff-age-of-surveillance-capitalism-google-facebook> (last accessed on 26 June 2019). For an in-depth study of surveillance capitalism, see Shoshana Zuboff, *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power* (New York, 2019).

<sup>47</sup> Alvin Chang, 'The Facebook and Cambridge Analytica scandal, explained with a simple diagram', *Vox*, 2 May 2018. Available online at <https://www.vox.com/policy-and-politics/2018/3/23/17151916/facebook-cambridge-analytica-trump-diagram> (Last accessed on 1 July 2019).

<sup>48</sup> Sean Illing, 'Cambridge Analytica, the shady data firm that might be a key Trump-Russia link, explained', *Vox*, 4 April 2018. Available online at <https://www.vox.com/policy-and-politics/2017/10/16/15657512/cambridge-analytica-facebook-alexander-nix-christopher-wylie> (Last accessed on 1 July 2019).

<sup>49</sup> Chase Johnson, 'Big tech surveillance could damage democracy', *The Conversation*, 4 June 2019. Available online at <https://theconversation.com/big-tech-surveillance-could-damage-democracy-115684> (Last accessed on 24 June 2019).

ago, Google was already boasting of its ability to collect 5 exabytes of data within two days.<sup>50</sup>

The Chinese tech giants are also in the business of surveillance capitalism. Like their American counterparts, they collect data on their platforms' users and monetise them in different ways. For example, companies pay Baidu for advertisements that are tactically distributed to the relevant users on its search platform. This service is the result of Baidu's ability to analyse its users' behaviour; the things that they are searching for may indicate what they would like to buy.<sup>51</sup> Baidu's Big Data initiatives extend far beyond marketing data to advertisers. It wants to be able to predict a wider range of activities and events than what users would like to buy. It is interested in harnessing the tools of Big Data to analyse diseases, box office results, sports results, the occurrence of natural disasters, and movement patterns during Chinese New Year.<sup>52</sup> It has established a Beijing Big Data lab and it has made its algorithms available to developers with an interest in forecasting events.<sup>53</sup> Baidu is also an ambitious player in the autonomous vehicles space, which is a very data-heavy enterprise.<sup>54</sup>

As China's e-commerce superpower, Alibaba also has access to a massive war chest of user data. Like other e-commerce companies, it uses its data to increase user engagement.

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<sup>50</sup> Xinlei Chen, 'China's digital monopolies are killing competition and need to be regulated', *South China Morning Post*, 20 August 2015. Available online at <https://www.scmp.com/comment/insight-opinion/article/1850448/chinas-digital-monopolies-are-killing-competition-and-need> (Last accessed on 27 June 2019).

<sup>51</sup> Ana Swanson, 'How Baidu, Tencent, and Alibaba are leading the way in China's big data revolution', *South China Morning Post*, 25 August 2015. Available online at <https://www.scmp.com/tech/innovation/article/1852141/how-baidu-tencent-and-alibaba-are-leading-way-chinas-big-data> (Last accessed on 1 July 2019).

<sup>52</sup> Ibid.

<sup>53</sup> Ibid.

<sup>54</sup> Ibid. See, also, Erika Clugston, 'Baidu dominates Chinese autonomous driving tests', *CleanTechnica*, 10 April 2019. Available online at <https://cleantechnica.com/2019/04/10/baidu-dominates-chinese-autonomous-driving-tests/> (Last accessed on 30 June 2019).

It recommends products to and creates individually-tailored search results for its users based on their shopping histories.<sup>55</sup> It is important to note that Alibaba's users include both consumers and sellers. Alibaba also uses its data to encourage sellers to maximise their engagement with its platforms. For example, it gives its sellers data that would help them to reach out to new buyers and to improve their ability to work in an e-commerce environment.<sup>56</sup> Alibaba also relies on insights from its data and on AI to boost its performance in a variety of areas related to its business, including logistics and the overall layout of its marketplace.<sup>57</sup> In e-commerce, the applications of Big Data extend far beyond the task of encouraging buyers and sellers to increase their engagement with their chosen platforms. The instruments of Big Data play a vital role in strengthening the quality of other operational aspects of the business; for example: coordinating supply chains, managing warehouses, and ensuring quick deliveries.<sup>58</sup>

It is undeniable that Tencent is also a Big Data superpower. This is due to the popularity of its WeChat app. It is not an exaggeration to claim that it would be difficult to get through daily life in China without access to WeChat, which already has over a billion monthly active users.<sup>59</sup> In the words of the *South China Morning Post*, it is China's 'everyday mobile app'.<sup>60</sup> WeChat is more than a chat platform; it also a gaming, e-commerce, news, and payments platform. It is even possible to book an appointment at a government

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<sup>55</sup> Ana Swanson, 'How Baidu, Tencent, and Alibaba are leading the way in China's big data revolution', *South China Morning Post*, 25 August 2015. Available online at <https://www.scmp.com/tech/innovation/article/1852141/how-baidu-tencent-and-alibaba-are-leading-way-chinas-big-data> (Last accessed on 1 July 2019).

<sup>56</sup> Ibid.

<sup>57</sup> Ibid.

<sup>58</sup> Ibid.

<sup>59</sup> Iris Deng and Celia Chen, 'How WeChat became China's everyday mobile app', *South China Morning Post*, 16 August 2018. Available online at <https://www.scmp.com/tech/article/2159831/how-wechat-became-chinas-everyday-mobile-app> (Last accessed on 30 June 2019).

<sup>60</sup> Ibid.



office through WeChat.<sup>61</sup> Like other tech platforms, WeChat is designed to enhance user engagement in order to limit the attractiveness of rival platforms. WeChat's users are able to run 'mini-programs' on the app. A 'mini-program' is a tiny app that is less than 10 megabytes in terms of size.<sup>62</sup> The key point to note is that the 'mini-programs' can be accessed and used from the main WeChat app; there is no need to download the 'mini-programs' as separate apps from a traditional app store.<sup>63</sup> WeChat, in other words, is "'an app that runs apps'".<sup>64</sup> About a million developers have flocked to the 'mini program' scheme.<sup>65</sup>

It must be noted that all three members of the BAT group have been leveraging their Big Data expertise to move into the provision of online financial services. In 2015, the BAT companies launched or announced their online banking services with the endorsement of the Chinese government.<sup>66</sup> Tencent launched WeBank in January 2015. WeBank's financial products, which include micro-loans, are marketed through Tencent's other platforms. Alibaba launched MYbank in January 2015. MYbank focuses on loans for people living in the countryside, tech start-ups, and people and other entities that sell products through TaoBao and Tmall. Baidu, in a partnership with CITIC bank, revealed its plans to form Baixin Bank in November 2015.<sup>67</sup> The tech giants' Big Data expertise gives them an edge

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<sup>61</sup> Ibid.

<sup>62</sup> Ibid.

<sup>63</sup> Ibid.

<sup>64</sup> Josh Ye, 'Tencent takes aim at Apple and Google app stores with WeChat mini program push', *South China Morning Post*, 22 January 2018. Available online at <https://www.scmp.com/business/article/2129987/tencent-takes-aim-apple-and-google-app-stores-wechat-mini-program-push> (Last accessed on 30 June 2019).

<sup>65</sup> Ibid.

<sup>66</sup> Deng Yuanyuan, 'Alibaba, Baidu, and Tencent and their new online banks', *CKGSB Knowledge* (an online publication run by the Cheung Kong Graduate School of Business), 2 December 2015. Available online at <http://knowledge.ckgsb.edu.cn/2015/12/02/finance-and-investment/alibaba-baidu-and-tencent-and-their-new-online-banks/> (Last accessed on 30 June 2019).

<sup>67</sup> Ibid.

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over traditional banks, particularly in assessing users' credit and identifying their unique needs.<sup>68</sup> MYbank, for example, does not rely on human loan officers. It relies, instead, on Big Data analysis to determine the size of its loans; the process of applying for a loan, moreover, is only a few minutes long.<sup>69</sup>

How will the rise of the Chinese tech giants, with their formidable Big Data tools, shape the future of China's political system and its state institutions? As we have seen, in the United States, the tech giants and their powerful platforms are now viewed by some as a threat to democracy. In China, on the other hand, there are strong signs at the moment that the rise of the Chinese tech giants will strengthen the existing authoritarian political system. In China, the rise of surveillance capitalism has made possible the rise of a mighty surveillance state.

It must be noted that the Chinese Communist Party has always been alert to the threat posed to its rule by the rise of the internet. The Chinese government has been an outspoken advocate of 'cyber sovereignty'. This means that it believes that countries should be allowed to shape, regulate, and operate their own internet systems without external interference.<sup>70</sup> The United States, of course, also monitors and regulates its internet ecosystem. But the Chinese state wields greater power over cyberspace than its American counterpart. The Cyberspace Administration of China will intervene whenever it identifies online activities that are not aligned with state goals. For example, in 2017, it investigated the users of Weibo, WeChat, and Baidu's Tieba for disseminating 'information of violence and terror, false rumours, pornography and other information

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<sup>68</sup> Ibid.

<sup>69</sup> Ibid.

<sup>70</sup> Niels Nagelhus Schia and Lars Gjesvik, 'The Chinese Cyber Sovereignty Concept (Part 1)', *Asia Dialogue* (the online magazine of the University of Nottingham), 7 September 2018. Available online at <https://theasiadialogue.com/2018/09/07/the-chinese-cyber-sovereignty-concept-part-1/> (Last accessed on 30 June 2019).

that jeopardizes national security, public safety and social order'.<sup>71</sup> The tech companies themselves came in for criticism. It was noted that they had failed to 'fulfill duties to manage illegal information uploaded by their users'.<sup>72</sup> In addition, the Chinese state operates a sophisticated internet filtering system as the 'Great Firewall' to block online content that it views as a threat to its goals and values. It has also been clamping down on the instruments used by Chinese citizens to climb over the 'Great Firewall'.<sup>73</sup>

The Chinese state, moreover, views Big Data as tool for enhancing its control of society and the economy. It is convinced that Big Data has made centralised economic planning feasible – indeed, possibly superior to the free market system.<sup>74</sup> The rise of the Chinese tech giants plays a central role in the Chinese state's vision. The Chinese state has come to the conclusion that the free market will continue to lose its relevance in an age when the online world and data collection are controlled by a very small number of Chinese tech monopolies.<sup>75</sup> It is now possible for the Chinese state to act, in partnership with the Chinese tech giants, as the central node of national data collection, thereby strengthening its ability to shape and control society and the economy.<sup>76</sup> These ambitions have given birth to the 'Social Credit System'. Under this scheme, the authorities would analyse data

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<sup>71</sup> Quoted in Jethro Mullen, 'China targets social media giants over "rumors" and "porn"', *CNN Business*, 11 August 2017. Available online at <https://money.cnn.com/2017/08/11/technology/tencent-baidu-sina-weibo-china-cybersecurity/index.html> (Last accessed on 30 June 2019).

<sup>72</sup> Quoted in Jethro Mullen, 'China targets social media giants over "rumors" and "porn"', *CNN Business*, 11 August 2017. Available online at <https://money.cnn.com/2017/08/11/technology/tencent-baidu-sina-weibo-china-cybersecurity/index.html> (Last accessed on 30 June 2019).

<sup>73</sup> Jethro Mullen, 'China targets social media giants over "rumors" and "porn"', *CNN Business*, 11 August 2017. Available online at <https://money.cnn.com/2017/08/11/technology/tencent-baidu-sina-weibo-china-cybersecurity/index.html> (Last accessed on 30 June 2019).

<sup>74</sup> Sebastian Heilmann, 'Big data reshapes China's approach to governance', *The Financial Times*, 29 September 2017. Available online at <https://www.ft.com/content/43170fd2-a46d-11e7-b797-b61809486fe2> (Last accessed on 24 June 2019).

<sup>75</sup> Ibid.

<sup>76</sup> Ibid.

on a wide range of activities – e.g. breaking traffic laws and expressing controversial views online – with a view to shaping the behaviour of individuals and businesses.<sup>77</sup>

China is *not* the first country in the world to invent the principle of using data to rate – and therefore shape – human behaviour. In the United States, for example, banks use the FICO credit score to assess its borrowers' ability to repay their loans. A person with a poor FICO credit score – perhaps because he has a history of not paying his bills on time – may have to pay a higher interest rate on his loans than someone who has a good FICO credit score.<sup>78</sup> Credit scoring also exists in other countries. Germany, for example, has a credit scoring system known as Schufa.<sup>79</sup> But China is probably the first country in the world to aim to apply the principle of rating behaviour across such a broad range of human activity, a goal that would not have been possible had Big Data not existed.

Big Data is clearly capable of contributing to the strengthening of China's existing political system. The social credit system is not the only sign of Big Data's compatibility with an authoritarian political system. China has also designed a security tool known as the 'Integrated Joint Operations Platform (IJOP)', which gathers and cross-references data and information from facial-recognition cameras, WiFi sources, cameras, public security checkpoints, financial documents, and reports issued on mobile apps used in field operations.<sup>80</sup> This integrated system detects anomalies and sends warning signals to

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<sup>77</sup> Ibid.

<sup>78</sup> For an explanation of the FICO credit score, see Justin Pritchard, 'How credit scores work and what they say about you', *The Balance*, 15 December 2018. Available online at <https://www.thebalance.com/how-credit-scores-work-315541> (Last accessed on 30 June 2019).

<sup>79</sup> Cathrin Schaer, 'Germany edges toward Chinese-style rating of citizens', *Handelsblatt Today*, 17 February 2018. Available online at <https://www.handelsblatt.com/today/politics/big-data-vs-big-brother-germany-edges-toward-chinese-style-rating-of-citizens/23581140.html?ticket=ST-953057-mP0vUj9ysq7UzciqSdcT-ap2> (Last accessed on 30 June 2019).

<sup>80</sup> Nathan Vanderklippe, 'China using big data to detain people before crime is committed: report', *The Globe and Mail*, 27 February 2018. Available online

the authorities, triggering the monitoring and perhaps even the detention of suspicious individuals.<sup>81</sup> Big Data's compatibility with China's authoritarian system shows that technology does not favour any particular political system. AI, Big Data, and social media are not the natural allies of democracy. Technology can be shaped to serve a broad variety of political ends.



### Read

Gray, Alex, "11 experts at Davos on the future of work" dated 26 Jan 2016 in the World Economic Forum website [downloaded on 26 Jan 2016], available at <https://www.weforum.org/agenda/2016/01/11-experts-at-davos-on-the-future-of-work/>



### Watch

Deloitte US, "Navigating the future of work | Deloitte Insights" dated 31 July 2017 in the YouTube website [downloaded on 31 July 2017], available at <https://www.youtube.com/watch?v=42VDYmcS4rk>



### Activity 1

This activity requires you to reflect on the types of jobs that could be destroyed as a result of automation. Compile a list of the jobs that are vulnerable to automation and a list of the jobs that machines may never be able to replace. Reflect on the similarities

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at <https://www.theglobeandmail.com/news/world/china-using-big-data-to-detain-people-in-re-education-before-crime-committed-report/article38126551/> (Last accessed on 30 June 2019).

<sup>81</sup> Ibid.

between the jobs in each list. What do these similarities tell us about the potential and the limits of automation?

This activity will require some research on your part. Please use respectable sources. You may consult the mainstream press (e.g. *The Straits Times* and *The New York Times*), academic publications, government publications, or even studies conducted by major companies.

Many of these sources are available online. You will find a lot of useful information on official government websites, for example. I also recommend that you consult some academic sources (e.g. scholarly journal articles) for this activity. Use Google Scholar and JSTOR for locating relevant peer-reviewed academic sources for this activity and share your findings with your classmates on Google Docs.

## Summary

This study unit has examined various aspects of the social and political impact of the rise of the tech giants. It shows that AI may worsen gender and racial inequalities. This is due to the fact that AI programmes, which are trained on biased real-world data, may not make impartial judgements and decisions. This study unit has also explained why the rise of the major tech platforms has made it easier for malicious actors to spread fake news and other forms of harmful content in the online world. Social media algorithms that recommend content to users based on their activity history play a role in facilitating the spread of harmful content. These algorithms may not expose users who have a history of consuming false or harmful content to content that may lead them to question their beliefs.

This study unit has also examined the impact of automation on the future of employment. The debate on the future of employment has given rise to optimistic and pessimistic perspectives. The optimists believe that although automation will destroy jobs, it will also create new jobs that will make up for job losses. The pessimists, on the other hand, fear that job losses will vastly outstrip gains.

Finally, this study unit has examined the impact of the rise of the tech giants on the American and Chinese political systems. We have seen that social media and surveillance capitalism – defined as the collection and monetisation of users' data – are now viewed as threats to democracy. In China, on the other hand, the rise of Big Data has possibly strengthened the country's existing authoritarian system.

## Formative Assessment

1. Facebook has done nothing to fight the spread of harmful content on its social media platform.
  - a. True.
  - b. False.
  
2. Which of the following statements accurately describes the pessimistic perspective on the impact of automation on jobs?
  - a. Automation will destroy jobs, but it will also create jobs. Moreover, the new jobs created will make up for the jobs that are destroyed.
  - b. Automation will boost productivity, leading to cheaper goods. This will lead to greater demand, leading to the hiring of more workers.
  - c. Humanity has faced many phases of automation throughout its history. Severe unemployment did not occur in earlier phases of automation. We can expect history to repeat itself.
  - d. Machines will replace so many classes of work that job losses will vastly exceed job gains.
  - e. All of the above.
  
3. Big Data can never be a threat to democracy.
  - a. True.
  - b. False.
  
4. Which of the following categories of events/activities has been subjected to Big Data analysis by Baidu?
  - a. Box office results.
  - b. Sports results.
  - c. Movement patterns during Chinese New Year



- d. Natural disasters
  - e. All of the above
5. Which of the following is the correct meaning of 'cyber sovereignty'?
- a. It refers to a powerful company's right to tell countries how they should shape, regulate, and operate their internet systems.
  - b. It refers to a powerful country's right to tell other weaker countries how they should shape, regulate, and operate their internet systems.
  - c. It refers to a country's right to shape, regulate, and operate its own internet system without foreign interference.
  - d. It refers to cyber warfare.
  - e. It refers to cyber security.

## Solutions or Suggested Answers

### Formative Assessment

1. Facebook has done nothing to fight the spread of harmful content on its social media platform.

a. True.

Incorrect.

b. False.

**Correct! Facebook is actively working to curb the spread of fake news on its platform. It also recognizes the importance of fighting the spread of extremist content, as demonstrated by its decision to ban white nationalist content on its platforms.**

2. Which of the following statements accurately describes the pessimistic perspective on the impact of automation on jobs?

a. Automation will destroy jobs, but it will also create jobs. Moreover, the new jobs created will make up for the jobs that are destroyed.

Incorrect. This is actually a description of the optimistic view on the impact of automation on jobs.

b. Automation will boost productivity, leading to cheaper goods. This will lead to greater demand, leading to the hiring of more workers.

Incorrect. This is actually a description of the optimistic view on the impact of automation on jobs.

c. Humanity has faced many phases of automation throughout its history. Severe unemployment did not occur in earlier phases of automation. We can expect history to repeat itself.

Incorrect. This is actually a description of the optimistic view on the impact of automation on jobs.

- d. Machines will replace so many classes of work that job losses will vastly exceed job gains.

**Correct! The rise of AI, according to the pessimists, will lead to the automation of learning and understanding. Many classes of work will therefore be swept away by the rise of AI, leading to a situation where job losses will exceed gains.**

- e. All of the above.

Incorrect! Option d is the only correct option.

- 3. Big Data can never be a threat to democracy.

- a. True.

Incorrect.

- b. False.

**Correct! Powerful tech monopolies could threaten democracy by using their data for political purposes.**

- 4. Which of the following categories of events/activities has been subjected to Big Data analysis by Baidu?

- a. Box office results.

Incorrect. This is not the only accurate option.

- b. Sports results.

Incorrect. This is not the only accurate option.

- c. Movement patterns during Chinese New Year

Incorrect. This is not the only accurate option.

- d. Natural disasters

Incorrect. This is not the only accurate option.

- e. All of the above

**Correct! All of the above are accurate options.**

5. Which of the following is the correct meaning of 'cyber sovereignty'?

- a. It refers to a powerful company's right to tell countries how they should shape, regulate, and operate their internet systems.

Incorrect.

- b. It refers to a powerful country's right to tell other weaker countries how they should shape, regulate, and operate their internet systems.

Incorrect. This is the very opposite of cyber sovereignty.

- c. It refers to a country's right to shape, regulate, and operate its own internet system without foreign interference.

**Correct! The governments that are in favour of cyber sovereignty believe that they have the right to assert control and influence over the internet systems in their countries. Take a look at option b, which is the very opposite of cyber sovereignty.**

- d. It refers to cyber warfare.

Incorrect.

- e. It refers to cyber security.

Incorrect.

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