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TikTok: Technology Overview and Issues

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SUMMARY

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TikTok: Technology Overview and Issues

TikTok is a globally popular video-sharing smartphone application (app) owned by ByteDance Ltd., a privately held company headquartered in Beijing, China. It is under increasing scrutiny by the U.S. government as a potential privacy and security risk to U.S. citizens. This is because ByteDance, like all technology companies doing business in China, is subject to Chinese laws that require companies operating in the country to turn over user data when asked to by the government. Researchers differ over how TikTok's collection of user data compares with other social media apps and whether TikTok poses a unique threat to the privacy and security of its U.S. users.

TikTok launched in the United States in August 2018. The app is available in over 155 countries in 39 languages and has approximately 800 million monthly active users. In the United States, the app has approximately 49 million monthly active users. TikTok's appeal lies heavily on what has been called its "addictive" video feed, For You. The app builds this feed through a "recommendation engine" algorithm built on artificial intelligence (AI) technologies and data mining practices. According to the company, the recommendation engine relies on a complex set of weighted factors to recommend content, including hashtags and videos watched previously, as well as the kind of device a person is using. TikTok critics cite problems with how much data TikTok collects from and about its users and with how that data is stored—and could be shared.

On August 6, 2020, President Trump signed an Executive Order aimed at stopping TikTok from doing business in the United States. Once in effect on September 27, 2020 (an extension from the original date of September 20), the order will prohibit any U.S. company or person from "transacting" with ByteDance. On August 14, 2020, the President issued a second Executive Order stating that ByteDance, its subsidiaries, and partners must divest from all assets that support TikTok's operations in the United States and destroy all previously collected U.S. user data. Divestiture may be accomplished by finding a U.S. buyer for TikTok. The requirements are designed to limit the Chinese government's access to current and future data from U.S. TikTok users. ByteDance does not want to divest from TikTok and has sued the Trump Administration. On September 27, 2020, Judge Carl J. Nichols of the United States District Court for the District of Columbia granted a preliminary injunction against the Trump administration order.

On September 14, 2020, Oracle announced that it had reached an agreement with ByteDance to "serve as [the company's] trusted technology provider" in the United States. Treasury Secretary Steven Mnuchin announced that he had received the proposal. From the terminology used, it appears that the deal may involve a partnership between the two companies rather than a sale. This arrangement would keep the source code of the For You recommendation engine in the hands of ByteDance. It is unclear if this deal satisfies the conditions in President Trump's Executive Orders. Secretary Mnuchin said that the Committee on Foreign Investment in the United States will review the proposal and present President Trump with its opinion. On September 19, 2020, Oracle announced that Walmart would be joining the TikTok acquisition.

Some believe TikTok and other Chinese-owned apps pose a serious security risk to the United States because Chinese companies are subject to China's laws that require compliance with government requests for data. Others believe that TikTok has fallen into "the crosshairs of a global technology battle" based on technology trade protectionism (this concept, also called "techno-nationalism," refers to a country's refusal or reluctance to import other countries' advanced technology, as well as to export, or to allow other nations to benefit from, its own advanced technology).

Similar situations may arise in the future with other apps created by foreign companies. Options that Congress may consider include (1) developing an overarching legal and regulatory framework to protect the security and privacy of U.S. citizens' data and communications, and (2) developing a uniform, transparent process to assess and mediate risks posed by foreign apps.

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Background

TikTok is a popular video-sharing smartphone application (app) owned by ByteDance Ltd., a privately held company headquartered in Beijing, China. The app is under intense scrutiny by the U.S. government as a potential privacy and security risk to U.S. users. A major concern is that ByteDance is subject to Chinese laws that require companies operating in China to turn over user data when asked to by the national government. On August 6 and August 14, 2020, President Trump signed Executive Orders aimed at stopping U.S. persons and entities from doing business with ByteDance[1] and requiring ByteDance to divest from any holding used to support the operation of TikTok in the United States.[2] Researchers differ over how TikTok's collection of user data compares with other social media apps and whether TikTok poses a unique threat to the privacy and security of its U.S. users, including many minors.

WeChat, another Chinese-owned app, is often mentioned in conjunction with TikTok, but the two apps are quite different. TikTok has a single function—short video—while WeChat has multiple—voice and data messaging, social media, and digital payment. WeChat is used in the United States primarily by the Chinese language community, whereas TikTok is used more widely. On the same day as the TikTok order, President Trump also signed an Executive Order prohibiting any U.S. individual or entity from engaging in any transaction related to WeChat and its owner, Tencent Holdings Ltd.[3] While issues with the two apps are often conflated, their functions, technical capabilities, and the data collected from their users are different. Only TikTok is discussed in this report. Background information about WeChat is in **Appendix**.

What Is TikTok?

On August 2, 2018, U.S. users of the Musical.ly app, a short video service headquartered in Shanghai, China, with a U.S. office in Santa Monica, CA, found that it had been merged into TikTok. Musical.ly had been acquired by ByteDance, the owner of TikTok, in November 2017 for $1 billion as a means to enter the U.S. market. The TikTok app is available in over 155 countries in 39 languages, and has approximately 800 million monthly active users.[4] In the United States, TikTok has approximately 49 million monthly active users[5] and the company maintains offices in Los Angeles and New York. When ByteDance first released the TikTok app in September 2016, videos could be no longer than 15 seconds, but now users are allowed to link together four 15-second segments.[6] Longer videos recorded outside the app can also be uploaded to the platform.

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[1] President Donald J. Trump, "Executive Order on Addressing the Threat Posed by TikTok," August 6, 2020, at https://www.whitehouse.gov/presidential-actions/executive-order-addressing-threat-posed-tiktok/.

[2] President Donald J. Trump, "Executive Order Regarding the Acquisition of Musical.ly by ByteDance Ltd.," August 14, 2020, at https://home.treasury.gov/system/files/136/EO-on-TikTok-8-14-20.pdf.

[3] President Donald J. Trump, "Executive Order on Addressing the Threat Posed by WeChat," August 6, 2020, at https://www.whitehouse.gov/presidential-actions/executive-order-addressing-threat-posed-wechat/.

[4] Katie Brigham, "How TikTok Became the Hottest App of 2020," *CNBC.com*, June 16, 2020, at https://www.cnbc.com/2020/06/16/tiktok-sees-rapid-growth-amid-quarantines-but-privacy-concerns-linger.html.

[5] Raymond Zhong and Sheera Frenkel, "A Third of TikTok's U.S. Users May Be 14 or Under, Raising Safety Questions," *New York Times*, September 17, 2020, sec. Technology, at https://www.nytimes.com/2020/08/14/technology/tiktok-underage-users-ftc.html.

[6] This limitation applies only to videos recorded through the app. Videos recorded using other methods or apps can be longer than 60 seconds. TikTok videos are intended for viewing on mobile device screens, rather than on computers or TV, and are formatted for that purpose.

ByteDance is currently estimated to be worth over $100 billion.[7] The company's core product in China is Toutiao, which means "Headlines." Toutiao began as a mobile news recommendation engine, but has evolved into a platform to deliver content and targeted advertising in other formats as well (e.g., text messages, images, question-and-answer posts, microblogs, videos).

TikTok's Recommendation Engine

TikTok's appeal relies on what has been called its "addictive" video feed, For You.[8] The app builds this feed through a "recommendation engine" using artificial intelligence (AI) technologies and data mining practices. How each user's feed is constructed had been a tightly held secret until recently. On June 18, 2020, TikTok published a blog post, "How TikTok Recommends Videos #ForYou."[9]

The company says its algorithm relies on a complex set of weighted factors to recommend content based on user preferences, including hashtags and videos watched; videos "liked," shared, and commented on; as well as the kind of device a person is using. Each user's feed is unique. **Table 1** lists the specific factors the company says it uses.

Table 1. "For You" Feed Factors and Elements

Factors	Elements
User interactions	• Videos liked or shared • Accounts followed • Comments posted • Content created
Video information/details	• Captions • Sounds • Hashtags
Device and account settings	• Language preference • Country setting • Device type These factors are included to make sure the system is optimized for performance, but they receive lower weight in the recommendation system relative to other data points because users don't actively express these as preferences.

Source: "How TikTok Recommends Videos #ForYou," TikTok Blog, June 18, 2020, at https://newsroom.tiktok.com/en-us/how-tiktok-recommends-videos-for-you.

[7] "ByteDance, the Chinese Company Behind Tiktok, Is Now Reportedly Worth over $100 Billion," *Business Insider India*, May 20, 2020, at https://www.businessinsider.in/stock-market/news/bytedance-the-chinese-company-behind-tiktok-is-now-reportedly-worth-over-100-billion/articleshow/75850118.cms.

[8] John Hermann, "How TikTok Is Rewriting the World," *New York Times*, March 10, 2019, at https://www.nytimes.com/2019/03/10/style/what-is-tik-tok.html.

[9] "How TikTok recommends videos #ForYou," *TikTok Blog*, June 18, 2020, at https://newsroom.tiktok.com/en-us/how-tiktok-recommends-videos-for-you.

According to TikTok,

> [a]ll these factors are processed by our recommendation system and weighted based on their value to a user. A strong indicator of interest, such as whether a user finishes watching a longer video from beginning to end, would receive greater weight than a weak indicator, such as whether the video's viewer and creator are both in the same country. Videos are then ranked to determine the likelihood of a user's interest in a piece of content, and delivered to each unique For You feed.

The blog post was seen by most as an effort to provide more transparency to the public as the U.S. government was increasing its scrutiny of the company's practices.[10]

Data Collection, Storage, and Sharing by TikTok

Critics, as well as some members of Congress, cite as problematic the amount of data that TikTok collects from and about its users, how that data is stored, and how it could potentially be shared with the Chinese government and used in influence campaigns[11] or against U.S. citizens.[12] Based on these concerns, both the Democratic and Republican national committees, the Department of Defense, and some private firms, such as Wells Fargo Inc., have banned or discouraged the use of the TikTok app.[13]

Data Collection

According to its privacy policy,[14] TikTok collects a range of user information, including location data and internet address, keystroke patterns, and the type of device being used to access the app. The app also collects and stores a user's browsing and search history within the app, as well as the content of any messages exchanged using the app. Additional information can be collected based on user permission: phone number, phone book, and social-network contacts; GPS data; user age; user-generated content (e.g., photos and videos); store payment information; and the videos "liked," shared, watched all the way through, and re-watched. TikTok states that the app collects less personal data than many other apps, such as Facebook and Google, both of which track user activity across devices (TikTok claims that it does not).[15] The data that TikTok collects from users appears in many regards to be comparable to what other social media companies

[10] Louise Matsakis, "TikTok Finally Explains How the 'For You' Algorithm Works," *Wired.com*, June 18, 2020, at https://www.wired.com/story/tiktok-finally-explains-for-you-algorithm-works/.

[11] Rebecca Jennings, "What's Going on with TikTok, China, and the US Government?" *Vox*, December 16, 2019, at https://www.vox.com/open-sourced/2019/12/16/21013048/tiktok-china-national-security-investigation. (Hereinafter, "What's Going on with TikTok, China, and the US Government?")

[12] Robert McMillan, Liza Lin, and Shan Li, "TikTok User Data: What Does the App Collect and Why Are U.S. Authorities Concerned?" *Wall Street Journal*, July 7, 2020, at https://www.wsj.com/articles/tiktok-user-data-what-does-the-app-collect-and-why-are-u-s-authorities-concerned-11594157084. (Hereinafter, "TikTok User Data: What Does the App Collect and Why Are U.S. Authorities Concerned?")

[13] Shelly Banjo, Kartikay Mehrotra, and William Turton, "TikTok's Huge Data Harvesting Prompts U.S. Security Concerns," *Bloomberg.com*, July 14, 2020, at https://www.bloomberg.com/news/articles/2020-07-14/tiktok-s-massive-data-harvesting-prompts-u-s-security-concerns. (Hereinafter, "TikTok's Huge Data Harvesting Prompts U.S. Security Concerns.")

[14] The privacy policy is available online at https://www.tiktok.com/legal/privacy-policy?lang=en.

[15] "TikTok User Data: What Does the App Collect and Why Are U.S. Authorities Concerned?"

gather and use.[16] Some critics have described TikTok's approach to data mining as aggressive[17] and that its ability to track user behavior while using the app, as well as access to a user's photos, videos, and phone book and geolocation tracking (based on user permissions), means that it can build extremely detailed behavioral profiles of its users that could potentially be shared with the Chinese government.[18] On August 11, 2020, the *Wall Street Journal* reported that TikTok avoided privacy safeguards in Google's Android operating system to collect users' mobile device MAC addresses, unique identifiers that allow "the app to track users online," and concealed this activity with an additional layer of encryption before ending the practice after 15 months in November 2019.[19]

Data Storage

TikTok claims to store all content created by U.S. users—as well as data about those users—only on servers located within the United States and backed up in Singapore. Those servers are owned or controlled by TikTok, but the company denies that it shares or would share this data with the Chinese government,[20] stating that:

> The key personnel responsible for TikTok … are all Americans based in the United States—and therefore are not subject to Chinese law. U.S. content moderation is likewise led by a U.S.-based team and operates independently from China, and, as noted above, the TikTok application stores U.S. user data on servers located in the United States and Singapore.[21]

Data Sharing

Despite these assertions, TikTok's website says that information can be shared with its parent company in China or other affiliates (usually advertisers), which operate under Chinese law.[22] Further, a lawsuit filed in federal court in December 2019 asserted that user data was harvested and sent to servers in China.[23]

White House TikTok Executive Orders

President Trump has issued two Executive Orders affecting the future of TikTok in the United States, one on August 6, 2020, and another on August 14, 2020.

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[16] Sherrod DeGrippo, "Understanding the Information TikTok Gathers and Stores," *Proofpoint*, January 8, 2020, at https://www.proofpoint.com/us/blog/threat-protection/understanding-information-tiktok-gathers-and-stores.

[17] Ryan Broderick, "Forget the Trade War. TikTok Is China's Most Important Export Right Now," *BuzzFeed News*, May 16, 2019, at https://www.buzzfeednews.com/article/ryanhatesthis/forget-the-trade-war-tiktok-is-chinas-most-important-export.

[18] "TikTok's Huge Data Harvesting Prompts U.S. Security Concerns."

[19] Kevin Poulsen and Robert McMillan, "TikTok Tracked User Data Using Tactic Banned by Google," *Wall Street Journal*, August 11, 2020, sec. Tech, at https://www.wsj.com/articles/tiktok-tracked-user-data-using-tactic-banned-by-google-11597176738.

[20] "TikTok User Data: What Does the App Collect and Why Are U.S. Authorities Concerned?"

[21] "Why We Are Suing the Administration," *TikTok Blog*, August 24, 2020, at https://newsroom.tiktok.com/en-us/tiktok-files-lawsuit.

[22] "TikTok User Data: What Does the App Collect and Why Are U.S. Authorities Concerned?"

[23] "Tiktok Sent US User Data to China, Lawsuit Claims," *BBC.com*, December 3, 2019, at https://www.bbc.com/news/business-50640110.

Prohibiting Transactions with ByteDance

The August 6, 2020, TikTok Executive Order was set to take effect on September 20, 2020, but that date has been extended to September 27, 2020. Once in effect, it will prohibit any U.S. company or person from transacting with ByteDance. The order does not state which specific transactions are to be prohibited, but it likely means, at least, the TikTok app will no longer appear on Apple's App Store or Google's Play Store in the United States. It might also make it illegal for U.S. companies to purchase advertising on TikTok. Some U.S. TikTok employees have speculated that they would no longer be able to be paid.

Requiring Divestiture of ByteDance from TikTok

On August 14, 2020, President Trump issued an additional Executive Order, "Regarding the Acquisition of Musical.ly by ByteDance Ltd.,"[24] that imposed additional conditions on the ability of ByteDance to operate TikTok in the United States. The order requires ByteDance and its "subsidiaries, affiliates, and Chinese shareholders" to divest from "any tangible or intangible assets or property, wherever located, used to enable or support ByteDance's operation of the TikTok application in the United States" as determined by the Committee on Foreign Investment in the United States (CFIUS).[25] The order also requires ByteDance to destroy all data obtained or derived from either the TikTok or Music.ly apps from U.S. users upon divestiture and certify in writing to CFIUS that it has done so. The order requires these actions within 90 days, rather than the 45 days included in the first order, giving ByteDance additional time to find a buyer.[26] A transfer of ownership and operation of TikTok to a U.S. entity not subject to Chinese laws, including management of collected user data, appears designed to limit the ability of the Chinese government to acquire access to future U.S. user data.

ByteDance Reaction to Divestiture Requirement

ByteDance opposed divestiture from TikTok and, on August 24, 2020, sued the Trump Administration.[27] In a blog post, TikTok stated that it was "shocked by the recent Executive Order, which was issued without any due process."[28] On September 27, 2020, Judge Carl J. Nichols of the United States District Court for the District of Columbia granted a preliminary injunction against the Trump administration order.

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[24] President Donald J. Trump, "Executive Order Regarding the Acquisition of Musical.ly by ByteDance Ltd.," August 14, 2020, at https://home.treasury.gov/system/files/136/EO-on-TikTok-8-14-20.pdf.

[25] CFIUS is an interagency committee that serves the President in overseeing the national security implications of foreign investment in the economy. For more information, see CRS In Focus IF10177, *The Committee on Foreign Investment in the United States*, by James K. Jackson.

[26] Lora Kolodny, "Trump Orders Bytedance to Divest from Its U.S. Tiktok Business Within 90 Days," *CNBC.com*, August 14, 2020, at https://www.cnbc.com/2020/08/14/president-trump-orders-bytedance-to-divest-from-its-us-tiktok-business-within-90-days.html.

[27] Rachel Lerman, "TikTok Sues Trump Administration to Fight Impending Ban," *Washington Post*, August 24, 2020, at https://www.washingtonpost.com/technology/2020/08/24/tiktok-lawsuit-trump. The lawsuit complaint is available online at https://assets.documentcloud.org/documents/7043165/TikTok-Trump-Complaint.pdf.

[28] "Statement on the Administration's Executive Order," *TikTok Blog*, August 7, 2020, at https://newsroom.tiktok.com/en-us/tiktok-responds. See also "Why We Are Suing the Administration," *TikTok Blog*, August 24, 2020, at https://newsroom.tiktok.com/en-us/tiktok-files-lawsuit.

China's Cybersecurity Law and Export Rules

The Cybersecurity Law of the People's Republic of China was passed in November 2016 and went into effect in June 2017. It was updated in November 2018 by the Regulations on Internet Security Supervision and Inspection by Public Security Organs. These laws—

- strictly control online activities;
- mandate the local storage of user data and the registration of certain network assets; and
- allow the government to conduct onsite and remote inspection of computer networks.[29]

The law requires Chinese companies to cooperate with government intelligence operations if so requested[30] and may allow the Chinese government access to user data collected by any company doing business in China. One analyst notes that "by demanding access to any data collected and stored in China, the updated regulations force [domestic and] foreign companies based in China to comply with its investigative measures, leaving intellectual property and private information vulnerable to government abuse."[31]

On August 31, 2020, China took specific action that could prohibit the sale of TikTok's underlying technology and processes. The new export regulations cover such technologies as "text analysis, content recommendation, speech modeling, and voice recognition."[32] Since the For You feed and algorithmic recommendation engine is considered the key element of TikTok's success, a ban on transferring the technology and processes used to create it could make it more difficult to sell the app or prevent a sale altogether.[33]

Status of Potential Oracle and Walmart Partnership with TikTok

In response to the TikTok Executive Order, two leading bidders emerged as potential buyers of the app: Oracle and a partnership between Microsoft and Walmart. Bids were reported to be in the range of $20 billion to $30 billion.[34] Twitter and Google were also rumored to be interested in acquiring the app.[35]

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[29] Generally defined in the Cybersecurity Law as five or more computers connected to the internet, which account for almost every foreign company operating in China.

[30] "What's Going on with TikTok, China, and the US Government?"

[31] Lauren Maranto, "Who Benefits from China's Cybersecurity Laws?" Center for Strategic and International Studies, June 25, 2020, at https://www.csis.org/blogs/new-perspectives-asia/who-benefits-chinas-cybersecurity-laws.

[32] Timothy B. Lee, "China Announces New Export Rules That Could Prevent Sale of Tiktok," *ArsTechnica.com*, August 31, 2020, at https://arstechnica.com/tech-policy/2020/08/china-announces-new-export-rules-that-could-prevent-sale-of-tiktok/. (Hereinafter, "China Announces New Export Rules That Could Prevent Sale of Tiktok.")

[33] "China Announces New Export Rules That Could Prevent Sale of Tiktok."

[34] In addition to U.S. companies making a bid for TikTok in the United States, Centricus Asset Management and Triller are reported to have made a bid to buy TikTok's operations in several other countries for $20 billion.

[35] Kim Lyons, "Twitter and TikTok Reportedly Have Had Talks About a Deal," *TheVerge.com*, August 8, 2020, at https://www.theverge.com/2020/8/8/21360259/twitter-and-tiktok-acquisition-trump-microsoft.

On September 13, 2020, Microsoft announced that its bid had been rejected by ByteDance. In its announcement, the company stated, "We would have made significant changes to ensure the service met the highest standards for security, privacy, online safety, and combating disinformation." One expert, Alex Stamos, Director of the Stanford Internet Observatory, commented that this statement is "an attempt to poison the well against an Oracle deal where they only take over hosting. And [Microsoft] is right to do so."[36]

On September 14, 2020, Oracle announced that it had reached an agreement with ByteDance to "serve as [the company's] trusted technology provider" in the United States. Treasury Secretary Steven Mnuchin announced that he had received the proposal.[37] From the terminology used, it appears that the deal may involve a partnership rather than a sale, with TikTok using Oracle's cloud hosting services.[38] This arrangement would keep the source code of the For You feed and algorithmic recommendation engine in the hands of ByteDance. Secretary Mnuchin said that CFIUS will review the proposal and present President Trump with its opinion.

On September 19, 2020, Oracle announced that Walmart would join its bid for TikTok, with the two companies acquiring 20% of a newly formed company, TikTok Global,[39] with the remaining 80% owned by ByteDance. According to announcements made by the companies, 40% of ByteDance is owned by U.S. investors, which is meant to indicate that the new company would be under majority U.S. ownership.[40] However, this arrangement, along with TikTok keeping the For You recommendation engine algorithm,[41] would not appear to satisfy conditions in President Trump's Executive Orders. In addition to U.S. approval of the proposal being uncertain given its provisions, Chinese approval of the proposal is also uncertain. China's new export regulations appear to forbid transfer of the For You algorithm, but the United States appears to require such a transfer. So, the legal requirements of each country are at odds with each other.

On September 23, 2020, TikTok filed for an injunction in federal court to stop a ban on the app that is set to take effect on September 27, 2020.

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[36] The Stanford Internet Observatory, a program of the Cyber Policy Center of the Freeman Spogli Institute for International Studies, is a cross-disciplinary program of research, teaching, and policy engagement for the study of abuse in current information technologies, with a focus on social media. Prior to his current position, Mr. Stamos served as Chief Security Officer of Facebook and Chief Information Security Officer at Yahoo. He has also been involved with securing the U.S. election system as a contributor to Harvard University's Defending Digital Democracy Project.

[37] Jordan Novet, "Oracle Confirms Deal with Tiktok-Owner Bytedance to Become 'Trusted Technology Provider'," *CNBC.com*, September 14, 2020, at https://www.cnbc.com/2020/09/14/oracle-confirms-deal-with-tiktok-owner-bytedance-to-become-trusted-technology-provider.html.

[38] Larry Dignan, "With TikTok, Oracle Hopes Its Cloud Infrastructure Business Goes Viral," *ZDNet.com*, September 21, 2020, at https://www.zdnet.com/article/with-tiktok-oracle-hopes-its-cloud-infrastructure-business-goes-viral/.

[39] "Walmart Statement About Potential Investment in and Commercial Agreements with TikTok Global," Walmart, September 19, 2020, at https://corporate.walmart.com/newsroom/2020/09/19/walmart-statement-about-potential-investment-in-and-commercial-agreements-with-tiktok-global.

[40] Jordan Novet, Spencer Kimball, and Alex Sherman, "Trump Agrees to Tiktok Deal with Oracle and Walmart, Allowing App's U.S. Operations to Continue," September 22, 2020, *CNBC.com*, at https://www.cnbc.com/2020/09/19/trump-says-he-has-approved-tiktok-oracle-deal-in-concept.html.

[41] Isobel Asher Hamilton, "TikTok's Deal with Oracle and Walmart Lets It Cling on to Its Most Valuable Asset—Its Algorithm," *BusinessInsider.com*, September 21, 2020, at https://www.businessinsider.com/tiktok-deal-lets-it-hold-onto-algorithm-2020-9.

Discussion

Some believe TikTok and other apps developed and owned by Chinese companies pose a serious security risk to the United States because Chinese companies are governed by China's Cybersecurity Law. Others believe that TikTok is caught up in increasing trade tensions between China and the United States.[42]

Threat to Security

Although TikTok forcefully states that it does not share U.S. user data with the Chinese government, many security and privacy advocates are skeptical. For example, in addition to the lawsuit cited above (see "Data Sharing"), the American Civil Liberties Union argues that "Chinese apps in particular have a reputation for grabbing more data than required to provide their services, often sending information to advertising networks … [they] are frequently far more abusive than others…"[43] The Chinese government obtains data about and created by *its own* citizens, for purposes that range from censorship to mass surveillance.[44]

Other countries have also taken action against TikTok on the grounds of security. India banned TikTok and 50 other Chinese apps in June 2020, calling them a "threat to sovereignty and integrity."[45] Also in June 2020, the European Union opened an investigation into TikTok to examine possible violations of its General Data Protection Regulation (GDPR).[46] Australia had threatened to ban the app, but on August 4, 2020, the country's Prime Minister indicated that TikTok would not be banned; however, he warned Australians against the app, saying it "connects right back to China."[47] Japan, Turkey, and Pakistan have also taken various measures to protect their countries' users from possibly security risks.[48]

Technology Trade Protectionism

Other observers argue that TikTok is caught in "the crosshairs of a global technology battle,"[49] and that a unilateral U.S. ban on any app may be comparable to China's "Great Firewall."[50] One

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[42] Kent Calder, "Opening Japan," *Foreign Policy*, vol. 47 (Summer 1982 1982), pp. 82-97, at http://www.jstor.com/stable/1148443. (Hereinafter, "Opening Japan.")

[43] "TikTok User Data: What Does the App Collect and Why Are U.S. Authorities Concerned?"

[44] Isobel Cockerell, "Inside China's Massive Surveillance Operation," *Wired.com*, May 9, 2019, at https://www.wired.com/story/inside-chinas-massive-surveillance-operation/.

[45] Kari Paul, "Should You Delete Tiktok? Here's What Experts Say About the App Trump Wants to Ban," *The Guardian*, July 16, 2020, at https://www.theguardian.com/technology/2020/jul/16/tiktok-video-sharing-app-should-you-delete-it.

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way to potentially understand U.S. and Chinese government actions in this dispute may be through the concept of techno-nationalism,[51] which refers to a country's refusal or reluctance to import other countries' advanced technology, as well as to export, or to allow other nations to benefit from, its own advanced technology. Within this framework, technology is considered a central pillar of a country's wellbeing:

> Techno-nationalism … links technological innovation and capabilities directly to a nation's national security, economic prosperity, and social stability.… [It] seeks to attain competitive advantage for its stakeholders, both locally and globally, and leverage these advantages for geopolitical gain.[52]

One policy mechanism that nations use to protect what they view as important or sensitive technologies are export controls, rules which limit to which foreign entities and under what circumstances or conditions specific technologies may be sold or licensed.[53] For example, in August 2020, the Bureau of Industry and Security at the Department of Commerce announced sanctions that restrict foreign semiconductor companies from selling chips developed or produced using U.S. software or technology to Huawei, another Chinese company, without first obtaining a license to do so.[54] This restriction has been called a "lethal blow"[55] to the company.

Another mechanism is the use of protectionist practices that privilege domestic entities' access to domestic markets. For example, China requires U.S. telecommunications companies to enter into a partnership with a Chinese company to provide services in that country. In June 2020, the Senate Committee on Homeland Security and Governmental Affairs Permanent Subcommittee on Investigations issued a report, "Threats to US Networks: Oversight of Chinese Government Owned Carriers." The report notes that while China has access to the U.S. telecommunications market, U.S. companies do not have that same level of access in China.

> China does not provide US telecommunications companies reciprocal access to the Chinese market and requires foreign carriers seeking to operate in China to enter into joint ventures with Chinese companies. These joint ventures often require U.S. companies to give their technology, proprietary know-how, and intellectual property to their Chinese partners.

Since China was allowed to join the World Trade Organization in 2001, the report notes that "not a single foreign firm has succeeded in establishing a new joint venture" to provide basic telecommunications services in China."

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Related Congressional Activity

Congress began taking an interest in TikTok as early as October 2019, when Senator Marco Rubio reportedly called for a formal investigation into whether TikTok posed a national security risk.[56] Later that month, Senators Charles Schumer and Tom Cotton sent a letter[57] to the Acting Director of National Intelligence, Joseph Maguire, expressing their concerns about TikTok and the national security risks they believe it poses. More formally, Congress has scrutinized TikTok in two hearings, and Members have introduced three related bills.

Hearings

The Senate Judiciary Committee's Subcommittee on Crime and Terrorism has held two hearings on, among other topics, the impact of Chinese smartphone apps on U.S. citizens' privacy:

- "How Corporations and Big Tech Leave Our Data Exposed to Criminals, China, and Other Bad Actors" was held on November 5, 2019.[58]
- "Dangerous Partners: Big Tech and Beijing" was held on March 4, 2020.[59]

TikTok was invited to testify at these hearings, but declined to appear.[60]

Legislation

Three bills have been introduced that would prohibit the use of TikTok and WeChat on U.S. government devices:

- S. 4452[61] is a bill to prohibit federal employees from downloading or using WeChat on government devices. It was introduced on August 5, 2020, by Senator John Kennedy and referred to the Senate Homeland Security and Governmental Affairs the same day.
- S. 3455,[62] the No TikTok on Government Devices Act, was introduced on March 12, 2020, by Senator Josh Hawley. This bill was passed by the Senate on August 6, 2020, and received in the House the following day. (See S.Rept. 116-250.[63])

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[56] Makena Kelly, "TikTok Should Be Investigated for Censorship, Marco Rubio Says," *TheVerge.com*, October 9, 2019, at https://www.theverge.com/2019/10/9/20906971/tiktok-censorship-china-bytedance-musically-marco-rubio-senate-mnuchin-cfius-treasury.

[57] Senator Tom Cotton, "Cotton, Schumer Request Assessment of National Security Risks Posed by China-Owned Video-Sharing Platform, Tiktok, a Potential Counterintelligence Threat with over 110 Million Downloads in U.S., Alone," press release, October 24, 2019, at https://www.cotton.senate.gov/?p=press_release&id=1239.

[58] The hearing page with archived video and other documents is online at https://www.judiciary.senate.gov/meetings/how-corporations-and-big-tech-leave-our-data-exposed-to-criminals-china-and-other-bad-actors.

[59] The hearing page with archived video and other documents is online at https://www.judiciary.senate.gov/meetings/dangerous-partners-big-tech-and-beijing.

[60] Tony Romm, "Apple, TikTok Decline to Testify at Second Congressional Hearing Probing Tech's Ties to China," *Washington Post*, February 24, 2020, at https://www.washingtonpost.com/technology/2020/02/24/apple-tiktok-congress-hearing-china/.

[61] The latest information on this legislation is available online at https://www.congress.gov/bill/116th-congress/senate-bill/4452.

[62] The latest information on this legislation is available online at https://www.congress.gov/bill/116th-congress/senate-bill/3455.

[63] The report is available online at https://www.congress.gov/congressional-report/116th-congress/senate-report/250/1.

- H.R. 6896,[64] also called the No TikTok on Government Devices Act, is the House companion bill to S. 3455. It was introduced on May 15, 2020, by Representative Ken Buck and referred to the House Committee on Oversight and Reform and the House Committee on Administration the same day.

Conclusion

The variety of apps available to U.S. users is enormous. Situations similar to the case of TikTok may arise in the future with other apps created by foreign companies. Congress may consider taking one or both of two parallel approaches to address such situations: (1) developing an overarching legal and regulatory framework to protect the security and privacy of U.S. citizens' data and communications, and (2) establishing a uniform, transparent process to assess the risks posed by foreign apps and establish mechanisms to mediate those risks.

[64] The latest information on this legislation is available online at https://www.congress.gov/bill/116th-congress/house-bill/6896.

Appendix. What Is WeChat?

WeChat was released in January 2011 and in 2018 became the world's most-used standalone mobile app, with over 1 billion monthly active users.[65] WeChat has been described as China's "app for everything"[66] because of its wide range of functions. Through the app, users can send messages, make mobile payments for purchases and send money to other users,[67] hail a ride, exchange contact information through Quick Response (QR) codes, share "moments" (similar to Facebook's "Newsfeed"), buy tickets to movies, and book a hotel room—as well as many other activities. In the second quarter of 2020, the app had an estimated 1.2 billion monthly active users,[68] up from about 889 million monthly active users in 2016.

Tencent, the Chinese company that owns WeChat, is the biggest video game company in the world. It was founded in 1998 and is worth about $500 billion as of May 2020.[69] The company owns the U.S. game studio Riot Games, as well as a large stake in U.S.-based Epic Games, which developed the popular game Fortnite.

As with TikTok, researchers have found evidence that WeChat shares user data with the Chinese government: "Every day, millions of WeChat conversations held inside and outside China are flagged, collected, and stored in a database connected to public security agencies in China."[70] Some U.S. users have reported that their messages to friends, family, and colleagues in China stopped being delivered after they shared news articles critical of the Chinese government; once they stopped sharing such articles, their access was restored.[71]

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[69] "WeChat Revenue and Usage Statistics (2020)," *BusinessOfApps.com*, July 30, 2020, at https://www.businessofapps.com/data/wechat-statistics/#1.

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