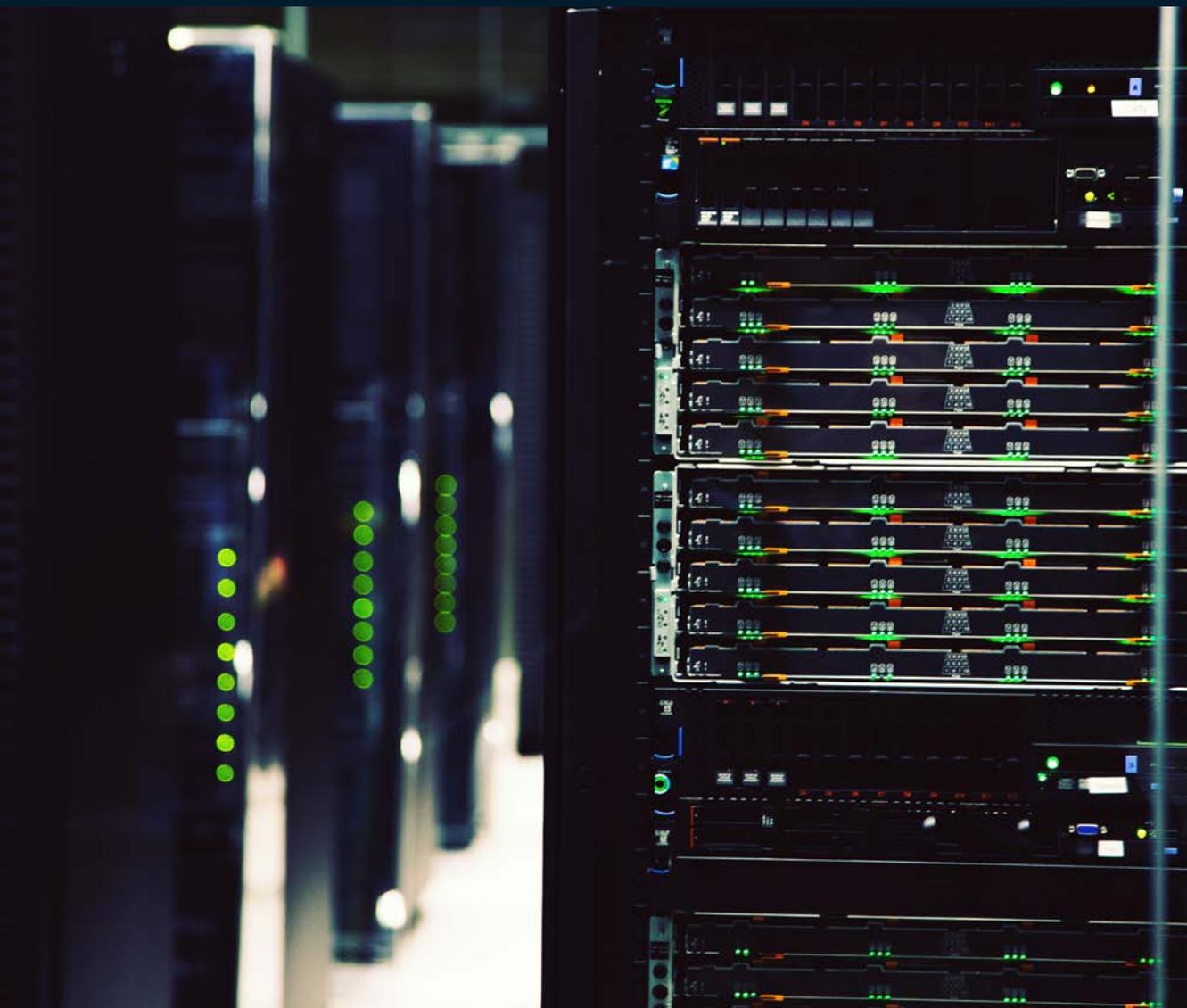




THEMATIC INSIGHTS

# The Digital Economy

Economic and business transformation through the growth of connectivity and digitization



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# A Digital Economy – Why now?

On July 2008, Steve Jobs told USA Today that the Apple App Store would launch with just 500 apps, 25% of which would be free. Jobs said at the time that “this is the biggest launch of my career”.<sup>1</sup>

It turned out (not for the only time) that Steve Jobs was right. The Apple App Store was set to become a digital storefront of software and other media for sale or subscription electronically. It disrupted the traditional software distribution: consumers reacted positively to the breadth of applications, the ease of use, the direct experience of tailoring and enhancing their personal devices. The Apple App Store was an immediate success and so created a



substantial new stream of revenues for Apple Inc., on top of its historic hardware and innovative personal device/phone businesses. The store grew from 500 apps in 2008 to 1.847 million apps as of first quarter of 2020<sup>2</sup>. Consumers spent an estimated \$54.2 billion dollars on in-app purchases, subscriptions, and premium apps.<sup>3</sup> According to data from App Annie, in Q1 2020, consumers worldwide spent \$15 billion in the App Store, the largest-ever quarter in terms of consumer spend on apps.<sup>4</sup>

Economic and business transformation through the growth of connectivity and digitization, powered by the explosion of accessible data and the speed and reach of the (mobile) internet will likely remain profound, cutting across sectors, geographies and markets. Companies have moved their business models to digital platforms using cloud computing and analytics-as-a-service, transactions via digital payments are becoming dominant, and people engage in billions of social media interactions and communications every day. We illustrate this trend with reference to seven key digital technologies.



- <sup>1</sup> [https://usatoday30.usatoday.com/money/industries/technology/2008-07-09-apple-apps-store-iphone-ipod\\_N.htm](https://usatoday30.usatoday.com/money/industries/technology/2008-07-09-apple-apps-store-iphone-ipod_N.htm)
- <sup>2</sup> <https://www.statista.com/statistics/276623/number-of-apps-available-inleading-app-stores/>
- <sup>3</sup> <https://www.statista.com/statistics/296226/annual-apple-app-store-revenue/>
- <sup>4</sup> <https://techcrunch.com/2020/04/02/consumers-spent-record-23-4-billion-on-apps-in-q1-2020-thanks-to-being-stuck-indoors/>

# Seven digital technologies in focus

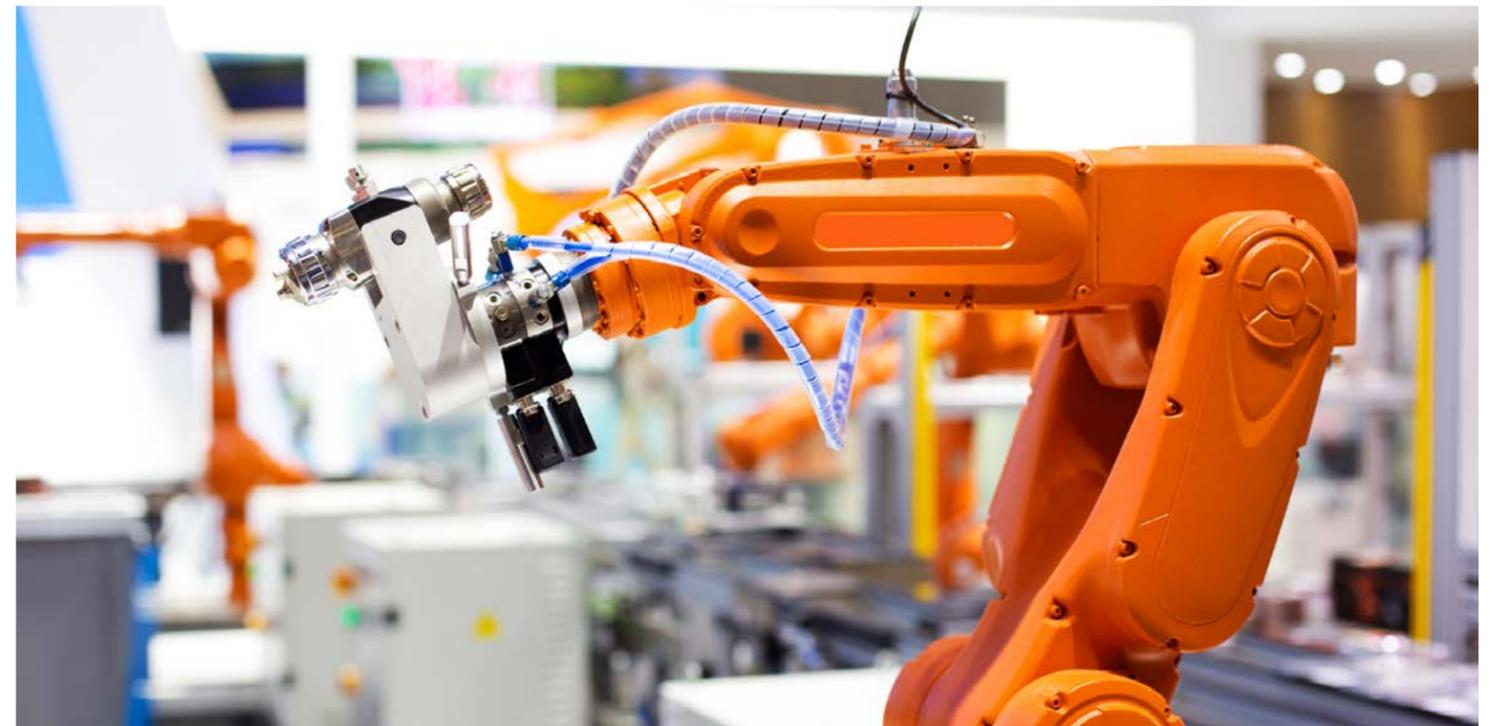
## Digital Payments

High usage of mobile devices and the increasing appetite shown by consumers for speedy and easy transactions has led global digital payments to be valued at \$3885.57 billion in 2019.<sup>5</sup> This market is expected to reach \$8686.68 billion by 2025, recording a CAGR of 13.7% between 2020 and 2025.<sup>6</sup>

New providers, new platforms, new tools and technologies launched over the last decade have made digital payments almost ubiquitous. For instance, Venmo (a mobile payment service owned by PayPal that lets account holders make and share payments with friends, split bills, cab fares etc)<sup>7</sup> had 40 million users at the end of the first quarter of 2019, bringing this digital-money transfer service only behind JP Morgan Chase & Co., which had 51 million digital users, according to WSJ.<sup>8</sup>

## Robotics

In the long-run, advances in machine sensing, engineering and machine learning will increasingly enable robots to work alongside humans in the workplace.<sup>9</sup> As the collaborative robots' ("cobots") costs decline and machine learning increases their capabilities, robots will likely transform any industry with workflows and physical processes. In logistics, Professor Goldberg of UC Berkeley said that by 2023 robots will reach "human or even superhuman mean picks per hour".<sup>10</sup> In the mobility sector, robot taxis are a real prospect and robots/drones will deliver parcels, reducing the cost of delivery.<sup>11</sup>



<sup>5</sup> <https://www.mordorintelligence.com/industry-reports/digital-payments-market>

<sup>6</sup> Ibid.

<sup>7</sup> <https://venmo.com/about/product/>

<sup>8</sup> <https://www.wsj.com/articles/venmo-has-40-million-users-outnumbering-most-big-banks-11556142906>

<sup>9</sup> Smids, J. Nyholm, S., and Berkers, H. (2019), Robots in the workplace: a threat or opportunity for-meaningful work? Philosophy & Technology.

<sup>10</sup> <https://www.technologyreview.com/s/610587/robots-get-closer-to-human-like-dexterity/>

<sup>11</sup> <https://www.globenewswire.com/news-release/2019/02/14/1725475/0/en/34-Billion-Delivery-Robots-Market-Global-Forecast-2024-Reduction-in-Delivery-Costs-in-Last-Mile-Deliveries-Driving-Growth.html>

## Cybersecurity

In the coming years, the use of artificial intelligence<sup>12</sup> and increased collaboration between negative actors<sup>13</sup> will likely boost cyber-attacks on consumers (e.g. phishing attacks, data breaches, extortion)<sup>14</sup> and their smart homes (e.g. voice-controlled digital assistants), enterprises (e.g. deep business systems compromise, Industrial Internet of Things (IIoT) devices disruptions) and governments. By the end of 2019, 27 billion devices were connected globally.<sup>15</sup> This number is projected to grow to 75 billion by 2025 due to declining costs as technology matures.<sup>16</sup>

At the same time, more data enter the cloud. For instance, electronic health record adoption has doubled since 2008.<sup>17</sup> As of 2017, nearly 9 in 10 (86%) office-based physicians had adopted an electronic health record.<sup>18</sup> At the same time, the global average cost of a data breach for 2019 reached \$3.92 million.<sup>19</sup> Evidently, this presents a huge business growth opportunity for firms seeking to offer solutions to address these security incidents and risks. It is, thus, no surprise that the global cybersecurity market was worth \$159 billion in 2019 and is forecasted to grow to \$270 billion by 2026.<sup>20</sup>

12 <https://symantec-blogs.broadcom.com/blogs/feature-stories/cyber-security-predictions-2019-and-beyond>

13 <https://www.mcafee.com/blogs/other-blogs/mcafee-labs/mcafee-labs-2019-threats-predictions/#digital>

14 <https://documents.trendmicro.com/assets/rpt/rpt-mapping-the-future.pdf>

15 <https://www.clickz.com/whats-ahead-for-iiot-many-things-2019/226144-2/226144/>

16 Ibid.

17 <https://dashboard.healthit.gov/quickstats/pages/physician-ehr-adoption-trends.php>

18 Ibid.

19 <https://securityintelligence.com/posts/whats-new-in-the-2019-cost-of-a-data-breach-report/>

20 Source: Australian Cyber Security Growth Network, SCP - Chapter 1 - The global outlook for cybersecurity, 2020; <https://www.austcyber.com/resources/sector-competitiveness-plan/chapter1>



## E-commerce

The dot-com revolution that began in the mid-90s changed the U.S. and the global economy. Companies like Amazon, Apple, Alibaba (among many others) have experienced huge growth as the retail world has reshaped, putting substantial pressure on traditional brick-and-mortar merchants. According to eMarketer, global e-commerce was projected to rise by 20.7% in 2019, to \$3.535 trillion.<sup>21</sup> By 2021, eMarketer expects global ecommerce to reach \$4.927 trillion, yet growth rates are forecasted to fall below the 20% beginning in 2020.<sup>22</sup> Companies are now focused on making shopping possible via video (e.g. YouTube, TikTok), communication (e.g. WhatsApp) and social media (e.g. Instagram) apps.<sup>23</sup> For instance, eBay and leading Australian retailer Myer have co-launched their inaugural virtual reality (VR) department store. Using a VR viewer, customers can have a new experience of shopping inside a Myer store.<sup>24</sup> IKEA (alongside other retailers) has launched an augmented reality (AR) catalogue app where consumers can explore how different pieces of furniture may fit in their own space.<sup>25</sup> Meanwhile Amazon and Domino's Pizzas are trialling deliveries via drones to make the delivery process faster, smarter and more cost-efficient.<sup>26</sup> Drones may also expand the reach to customers who live in remote areas. Beyond these and similar innovations, increasing affluence, consumerism and mobile device adoption in developing markets can create new e-commerce opportunities.

21 <https://www.emarketer.com/content/global-ecommerce-2019>

22 Ibid.

23 <https://a16z.com/2020/01/23/four-trends-in-consumer-tech/>

24 <https://www.ebayinc.com/stories/news/ebay-australia-helps-launch-the-worlds-first-virtual-reality-department-store-into-the-world-of-virtual-reality/>

25 <https://www.ikea.com/gb/en/customer-service/mobile-apps/>

26 <https://www.businessinsider.com/drone-delivery-services?r=US&IR=T>

## The Sharing Economy

The sharing economy is defined by PwC as “any marketplace that allows individuals and groups to make money from underused physical assets by turning them into shared services.”<sup>27</sup>

Consumers have already demonstrated a strong appetite for sharing-based companies, such as Airbnb, Uber and Ola. Users borrow goods, rent homes, and serve up micro-skills in exchange for access or money.<sup>28</sup> In 2016, in the US, there were 44.8 million adults using the increasingly popular sharing economy services.<sup>29</sup> Statista forecasts that this number will grow to 86.5 million by 2021.<sup>30</sup> McKinsey also estimates that in the U.S. and Europe alone, 162 million people or 20-30% of the workforce are providers on sharing platforms.<sup>31</sup> Millions of people depend on various income streams and work independently. Declining transaction costs and increasing internet connectivity have helped the sharing economy advance – and the trend is well supported by the increase in digital connectivity.<sup>32</sup> What makes participation in the sharing economy appealing? The economic gains, convenience, enjoyment of the activity and enhanced environmental protection and sustainability.<sup>33</sup> So far, collaborative consumption has dominated industries like transportation (e.g. Uber, Didi Chuxing Technology, Ola), hospitality (e.g. Airbnb), consumer goods (e.g. eBay, Etsy), and services (e.g. Upwork). Despite regulatory uncertainty, lack of government oversight, the vulnerability of the social model of the gig economy and issues with discrimination, the sharing economy is still forecast to disrupt many other traditional sectors where products/services can be shared for use, instead of being owned. According to Brookings, the sharing economy market is expected to grow to USD \$335 billion by 2025.<sup>34</sup>

27 [https://www.pwc.fr/fr/assets/files/pdf/2015/05/pwc\\_etude\\_sharing\\_economy.pdf](https://www.pwc.fr/fr/assets/files/pdf/2015/05/pwc_etude_sharing_economy.pdf)

28 <https://www.forbes.com/sites/bernardmarr/2016/10/21/the-sharing-economy-what-it-is-examples-and-how-big-data-platforms-and-algorithms-fuel/#66582447c5af>

29 <https://www.statista.com/statistics/289856/number-sharing-economy-users-us/>

30 Ibid.

31 <https://www.mckinsey.com/featured-insights/employment-and-growth/independent-work-choice-necessity-and-the-gig-economy>

32 Frenken, K. and Schor, J. (2017) Putting the sharing economy into perspective, *Environmental Innovation and Societal Transitions*, 23, 3-10.

33 Hamari, J., Sjöklint, M., & Ukkonen, A. (2015). The sharing economy: Why people participate in collaborative consumption. *Journal of the Association for Information Science and Technology*, 67, 9, 2047–2059.;

<https://www.forbes.com/sites/annabellau/2015/06/03/dip-into-the-sharing-economy-for-convenience-community-and-extra-cash/#26a2161c1b00>;

[https://www.pwc.fr/fr/assets/files/pdf/2015/05/pwc\\_etude\\_sharing\\_economy.pdf](https://www.pwc.fr/fr/assets/files/pdf/2015/05/pwc_etude_sharing_economy.pdf);

<https://drivinginnovation.ie.edu/how-the-sharing-economy-is-disrupting-business/>

34 <https://www.brookings.edu/research/the-current-and-future-state-of-the-sharing-economy/>



## Social Media

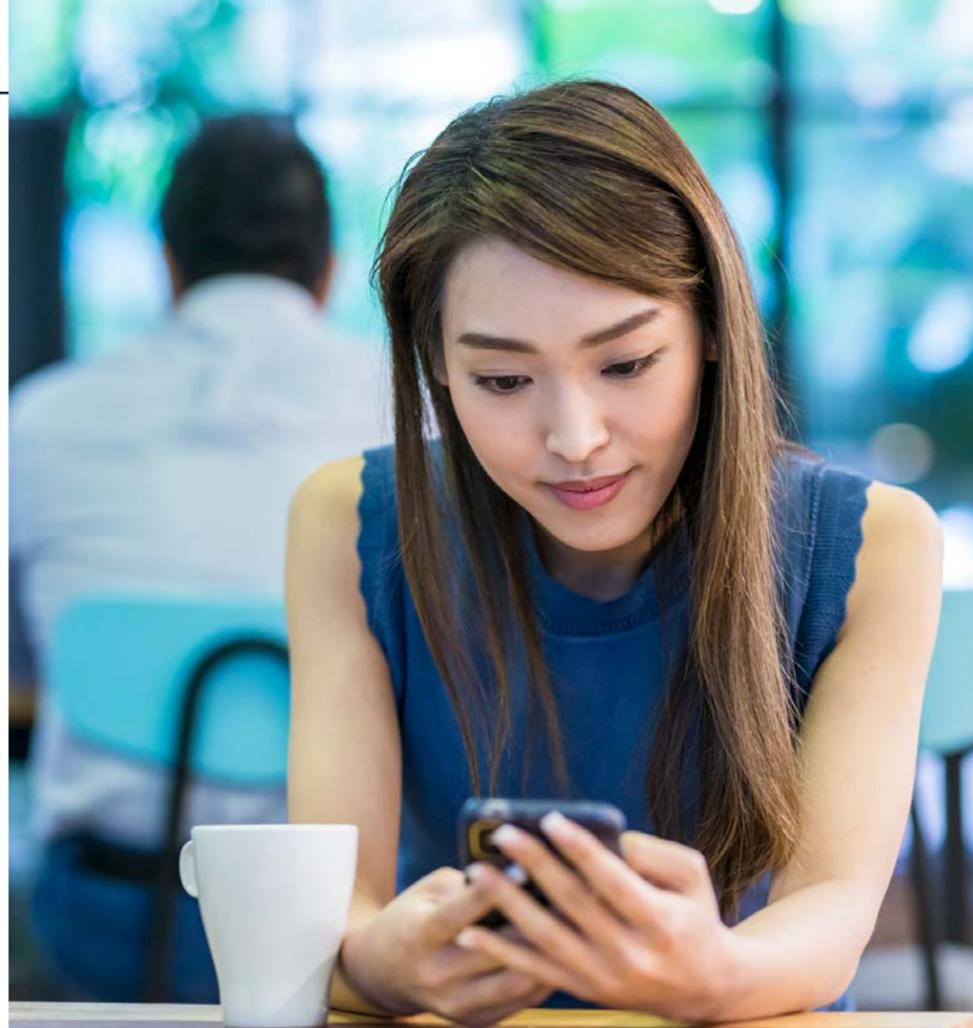
In January 2020, Facebook had 2,449m active users, Whatsapp had 1,600m active users and Weixin/Wechat had 1,151m.<sup>35</sup> Digital communities have become a dominant form of communication and information sharing.<sup>36</sup> The first recognizable social media site, Six Degrees, was created in 1997. It enabled users to upload a profile and link to others. Then, Friendster, MySpace and subsequently Facebook entered and dominated the segment. Interestingly, platforms like Facebook don't have to create value themselves. Instead, they enable the creation of value by producers and consumers in their networks by providing an easy to use infrastructure for people to connect, creating incentives for engagement and rules to foster these interactions.<sup>37</sup> The popularity of social media is astonishing.

35 <https://www.smartinsights.com/social-media-marketing/social-media-strategy/new-global-social-media-research/>

36 Ibid.

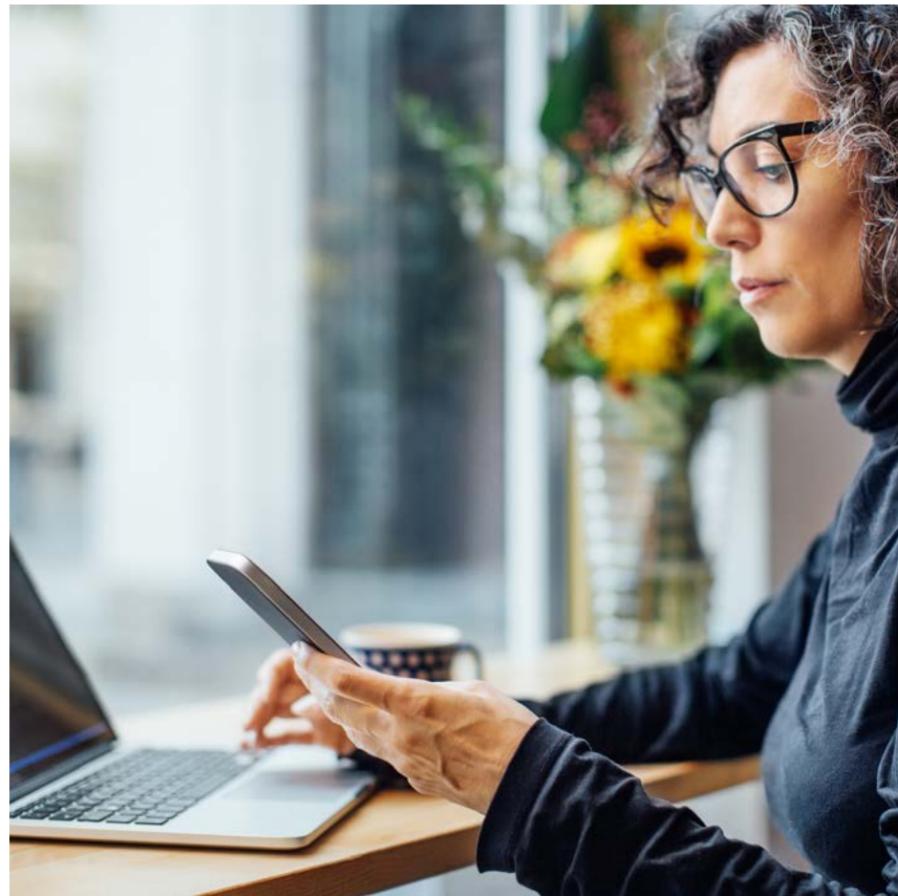
37 Parker, G., Van Alstyne, M., and Choudary, S. (2016), *Platform revolution: How networked markets are transforming the economy and how to make them work for you*, New York: WW Norton & Co.

In January 2020, an estimated 3.8 billion people were using social media worldwide.<sup>38</sup> Also, the way people use social media has changed. Internet users now spend 15 minutes longer per day on social platforms than watching TV programmes.<sup>39</sup> Despite the fact that 70% of the U.S. population use social media, there is still room to grow both in the U.S. and globally, where penetration is at 45%.<sup>40</sup> Zenith predicts that global social media advertising expenditure will grow 20% in 2019 to reach US\$84bn.<sup>41</sup> Social media growth is slowing, and is forecast at 17% in 2020 and 13% in 2021.<sup>42</sup>



## Cloud Computing

Not that long ago, the dominant enterprise model was for all computing power to be owned and operated by companies in their own premises. Companies from diverse sectors - from Capital One to Conde Nast - had physical, on-site servers delivering information to computer requests. They were buying their equipment from server manufacturers such as Dell and Cisco and were developing their own data centres. In 2006, the widespread arrival of accessible cloud-based computing (with Amazon Web Services - AWS) disrupted the enterprise IT sector with state-of-the-art, secure data centres that were professionally managed. As the world becomes more digital and connected, cloud computing is increasingly embedded into the businesses that touch every aspect of our lives. Data and software can be easily accessed anywhere, anytime, via the Internet. According to LogicMonitor's survey, 83% of organizations expect to have workloads deployed in the cloud by the end of 2020.<sup>43</sup> Of those, 41% will be run on public cloud platforms, 20% by private cloud and the remaining 22% by hybrid cloud.<sup>44</sup>



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**His research focuses on organisational ambidexterity: how companies can excel at both incremental and radical innovation.**

<sup>38</sup> <https://www.smartinsights.com/social-media-marketing/social-media-strategy/new-global-social-media-research/>

<sup>39</sup> <https://blog.globalwebindex.com/trends/social-media-usage-evolved/>

<sup>40</sup> <https://www.statista.com/topics/3196/social-media-usage-in-theunited-states/>

<sup>41</sup> <https://www.zenithmedia.com/social-media-overtakes-print-to-become-the-third-largest-advertising-channel/>

<sup>42</sup> Ibid.

<sup>43</sup> <https://www.forbes.com/sites/louiscolombus/2018/01/07/83-of-enterprise-workloads-will-be-in-the-cloud-by-2020/#7d4bbdf16261>

<sup>44</sup> Ibid.



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