

CHAPTER

3

THE NEW MEDIA ENVIRONMENT



FINDINGS

- ▶ A confluence of economic, social and political circumstances, along with technological advancements, has created a “perfect storm” that is destabilizing citizen trust in media and in other democratic institutions more generally.

- ▶ Exponential advancements in digital technology, coupled with explosive growth in broadband internet and ubiquitous mobile access, have dramatically shifted how news and information are produced, distributed and consumed.

- ▶ The steep decline in advertising revenues for print newspapers over the past two decades has challenged the viability of business models for the traditional news industry.

- ▶ Social media platforms connect users across the world and have expanded their access to information. But they have also provided a means for promoting civil unrest and sectarian violence and have raised concerns about privacy, manipulation and foreign interference.

- ▶ The “public square” has become a 24-hour, continuously connected mobile experience supported by social networks, broadcast and cable television.

- ▶ Navigating the new media environment and separating truth from nontruth will be more challenging as emerging technologies, such as virtual reality, augmented reality, artificial intelligence, bots and deepfakes, become more sophisticated.

The media landscape that has emerged over the past several decades has played a role in the diminishing trust in American media. We see it as a perfect storm, driven by rapid and persistent technological change along with the declining business model supporting local journalism and the increased polarization of American politics.

Exponential improvements in computing power, the growth of broadband and mobile communications, and, most recently, the rise of social media have reshaped the media landscape and dramatically altered how Americans access and share information. Collectively, these factors have created a challenging new environment that is altering the role of news in a democracy and influencing citizens' attitudes toward news. The first factor to consider is the speed with which these technologically driven changes have happened.

Most technologies evolve gradually after their initial introduction. Railroads, for example, are faster and more efficient now than when they appeared in the mid-19th century. But they still operate today in essentially the same way as when they were first introduced. Much the same is true of other technologies, like automobiles, aircraft and even broadcasting.

But this is not true of digital technology. Since the advent of the first electronic computer 70 years ago, digital technology has gone through a series of transformations that has taken it—and its users—on an exponential journey.

The development of the integrated circuit, which is at the heart of modern digital technology, gave rise to Moore's Law (1965). According to that law, the number of elements (transistors) in an integrated circuit doubles every two years, enabling raw computing power to increase at the same rate. This has held true for the past 50 years. As a result, digital computers have steadily become faster, smaller, cheaper and more powerful at an exponential rate. Uses that seemed like science fiction at one point have become ordinary reality a few years later. For example, each of the smartphones that millions of people now carry has more computing power than the most advanced supercomputers of just a few decades ago.

[SOCIAL MEDIA] PRESENTS OPPORTUNITIES FOR POLITICAL ENGAGEMENT ON BOTH THE INSTITUTIONAL AND INDIVIDUAL LEVEL. BUT IT ALSO MAKES POSSIBLE THE WEAPONIZATION OF INFORMATION IN WAYS THAT PROMOTE CONFLICT AND CONFUSION.

The impact of the exponential improvement of digital computers has been magnified by two related trends: the growth of the internet and the rise of mobile communications that have connected billions more people. The most recent shift has been the emergence of social media platforms that have transformed the way people communicate with one another. As *New York Times* columnist Tom Friedman summarizes these changes:

In the early 2000s, a set of technologies came together into platforms, social networks and software that made connectivity and solving complex problems fast, virtually free, easy for you, ubiquitous and invisible. Suddenly, more individuals could compete, connect, collaborate and create with more other people, in more ways, from more places, for less money and with greater ease than ever before.⁴⁶

Even in the relatively early days of the internet's growth, however, a number of problems became apparent. For example, since setting up a decent website required few resources and creators can be anonymous, it was challenging for users to differentiate between established, credible institutions and more dubious sources online. It was also difficult to figure out where web content was coming from or who was creating it, which offered opportunities for bad actors to provide fake or misleading content. Viruses appeared that could spread rapidly through the internet and infect millions of computers. Security breaches that compromised personal information happened with increasing frequency. Spam began to clog users' mailboxes. Multiple industries were disrupted as the creation and distribution of content shifted from physical to digital form.

Still, the internet grew rapidly. While relatively few Americans used it in the early 1990s, more than half were on by 2000, and by 2017 more than 90 percent of Americans were. Two important drivers of this growth have been broadband networks and mobile communications.

Growth of Broadband and Mobile

Beginning in the late 1990s, broadband access became a reality for many users. All-digital broadband connections were not only faster than previous “narrowband” connections, but they were “always on” and did not require a time-consuming logon process. In less than a decade, broadband was the dominant means by which Americans connected to the internet.

Thanks to broadband, the psychological distance between users and cyberspace shrank substantially. As it got easier, people went online more frequently, did more while online and stayed longer. Sharing rich media like music, photos and video became common. YouTube launched in 2005, and by the end of the year, it was generating 8 million video views a day. In 2007 Netflix, which had started by distributing movies on DVDs through the mail, introduced a broadband streaming service. It then rapidly shifted from being the fastest-growing customer of the U.S. Postal Service to being one of the largest generators of internet traffic.

The next big revolution was the move to wireless connections. Cellphones initially appeared in the mid-1980s, and for two decades they remained just portable telephones. That changed in 2007 with the introduction of Apple’s iPhone, the first true “smartphone” that was as much a miniature computer as mobile phone, and could support a wide variety of uses. Notably, the instrument included a web browser designed for the iPhone’s small screen, which enabled mobile access to the entire web.



In addition, Apple introduced “apps,” tiny programs available through its App Store, that each performed a single function. By creating a platform that allowed others to develop and distribute their own iPhone apps (subject to Apple’s approval), Apple helped build a rich ecosystem for new uses of mobile devices. Competitors answered this challenge with their own smartphone software. For example, Google introduced the Android mobile operating system, which was adopted by many other manufacturers.⁴⁷

Just as wired computer networks evolved from narrowband to broadband, so wireless networks steadily improved their performance. With each new generation of wireless technology, cellular carriers upgraded the speed and reach of their networks, while fast (and often free) Wi-Fi access became increasingly pervasive.

Due to the prevalence of smartphones and other connected devices, it has increasingly become a “mobile first” world. In 2008, Americans spent 80 percent of their online time on laptops or desktops. Just eight years later, more than half of their online time had moved to mobile devices.

A 2018 Pew study highlights the importance of smartphones to usage levels: 31 percent of smartphone users are “online almost constantly,” compared with just 5 percent of nonusers.⁴⁸ Among U.S. teens and young adults, 95 percent have a smartphone, and 45 percent say they are online almost constantly.⁴⁹

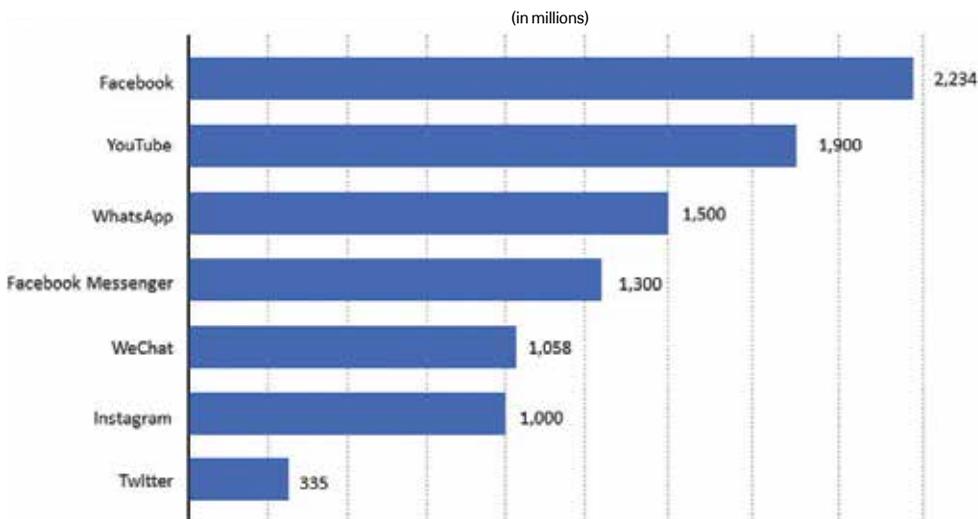
Thanks to the popularity of wireless broadband and smartphones, cyberspace has become a pervasive digital environment that accompanies people wherever they go. Checking, sharing and commenting on news can now be done throughout the day. Podcasting has provided a new way for people to listen to the news. Voice-activated devices distribute content. Within a few years, the next generation of mobile technology (5G) promises to provide even faster, more pervasive wireless connections, not just among humans but for the Internet of Things (linking devices such as webcams, alarms, sensors and even autonomous vehicles) as well.

The Advent of Social Networks

The most recent chapter in the evolution of the internet has been the shift from a focus on providing access to information and transactions to connecting people to one another through social networks. Communication functions like email, bulletin boards, texting and chat have long been popular. But the rise of social media networks vastly increased the person-to-person function of the internet and inspired people to share the most intimate aspects of their lives, often in real time. Social media provided a new kind of platform that allowed individuals and groups that had not previously had a voice to express themselves and reach others with similar interests. It has also provided new channels for the dissemination of both information and disinformation, renewed connections and bullying, political fundraising and intentional misrepresentations.

The most dramatic example of this shift is the spectacular rise of Facebook. After it was founded in 2004, it took Facebook four years to reach its first 100 million users. In the next four years, Facebook grew to 1 billion users and since then has topped 2 billion users (see Figure 3.1).⁵⁰ Facebook is now truly global. Although it started in the United States, only about 10 percent of its current user base (214 million people) comprises Americans. For many people around the world, Facebook is the internet.

FIGURE 3.1 ACTIVE USERS OF SOCIAL MEDIA, IN MILLIONS
As of October 2018



Source: <https://www.statista.com/statistics/272014/global-social-networks-ranked-by-number-of-users/>

Though not as massive as Facebook, other, newer social networks are still impressively large: YouTube, owned by Google's parent, Alphabet, has nearly 2 billion users. Twitter, started in 2006, has 335 million monthly users and over 100 million daily users. WhatsApp, founded in 2009 and now owned by Facebook, has 1.5 billion users, and Instagram, launched in 2010 and also owned by Facebook, has 1 billion users worldwide. Snapchat, started in 2011, has 291 million monthly users.

Not all popular social networks are U.S. based: Tencent's WeChat, a Chinese-language social network, had more than 1 billion monthly active users as of mid-2018.⁵¹

With the proliferation of smartphones, it is possible to stay almost continuously connected to social networks—and many people do. More than a billion users log on to Facebook from a mobile device daily, and often multiple times a day.⁵² And services like Instagram, WhatsApp and Snapchat are designed as exclusively mobile applications.

THE ROLE OF PLATFORMS

Given their scale, a major technology company's online services are often described as platforms. Platforms typically create little content of their own. They connect users with others who have content of interest to them. Though the nature and specific function of platforms vary, they are by definition large enough to be the foundation of their own ecosystems. These platforms have become the primary organizing means by which most people use the internet.

Most commonly, “platform” describes what we refer to as social networks or social media—services whose primary function is to connect people to share personal information, activities and opinions.

In his book *Custodians of the Internet*, Tarleton Gillespie defines social media platforms as “online sites and services that host, organize, and circulate users’ shared content or social interactions for them, without having produced (the bulk of) that content.”⁵⁴ In this category, Gillespie includes social networks such as Facebook and LinkedIn, along with blogging/microblogging providers such as Twitter, Tumblr and WordPress; photo and video sharing sites like Flickr, Pinterest and YouTube; and collaborative knowledge sharing tools like Wikipedia and wikiHow.

Gillespie also identifies “a second set [of platforms] that, while they do not neatly fit into the definition of [social] platform, grapple with many of the same challenges of content moderation in platform-like ways.” Included in this category are search engines like Google and Bing; “exchange platforms” like eBay, Craigslist, Airbnb and Uber; and recommendation and rating sites such as Yelp and TripAdvisor.⁵⁵ Platforms generally generate revenue either by attracting advertisers who want to reach their large number of users or by taking a percentage of the transactions that they facilitate.

Amid this impressive growth, young people’s use of social media is undergoing a significant shift. For American teens, Facebook is no longer as dominant, with the percentage of teens who say they use Facebook dropping from 71 percent in 2015 to 51 percent in 2018, lower than the shares who use Instagram, YouTube or Snapchat.⁵³

Social networks have connected people in new ways. They enabled countless families and friends to stay in touch even while they are geographically separated. They are used for pro-social campaigns, such as encouraging people to become organ donors or young people to register to vote. Activists use them to raise awareness of social injustices. And citizens of repressive regimes have organized protests online, which have led even to the fall of governments.⁵⁶

Few people, even including some early investors in social media companies,⁵⁷ anticipated how these tools would be used for anti-social purposes. Yet we have seen in recent years online bullying, manipulation of public opinion with impersonation and false information, and the encouragement of sectarian violence.

As the medium is global and instantaneous, erroneous information can become amplified and mostly irretrievable.⁵⁸

From Social Networks to Social Media

A powerful force shaping these global social networks is the business model that determines how they operate. Since these services are free to use, they depend on advertisers for revenue. As Silicon Valley entrepreneur Gina Bianchini explained to the Commission, in the mid-2000s “social networks became social media.” In so doing, they moved from a focus on connecting users to one another to monetizing their users with targeted advertising tools. Because operators sell audiences to advertisers, they have a strong incentive to attract as many users as possible and to maximize the amount of time they spend on their sites.

Because these sites are digital, they routinely capture large amounts of detailed data on the interests and behavior of their users. With this data, operators are able to fine-tune the algorithms that determine what users see, in order to maximize their appeal. The extensive information that they gather on users allows advertisers to reach those most likely to be interested in their products.

Researchers and observers have explored the way in which designers of these entities deliberately work to make them as addictive as possible to keep users coming back.⁵⁹ Others, referring to the popularity of extreme content online, point out that “polarization may be bad for democracy, but is a great business model.”⁶⁰ But the same has also been said about cable television news, partisan digital sites and broadcast media.⁶¹

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Cumulative Impact

According to some observers, electronic media—social networks along with broadcast and cable television—have become the central “public square” for the U.S. and much of the rest of the world. That is, they have become the primary means by which citizens learn about and debate the meaning of what is happening in the world. If so, the combination of eight distinctive characteristics of these media are posing new and unprecedented challenges to Americans’ trust in their media and their democracy. These factors are:

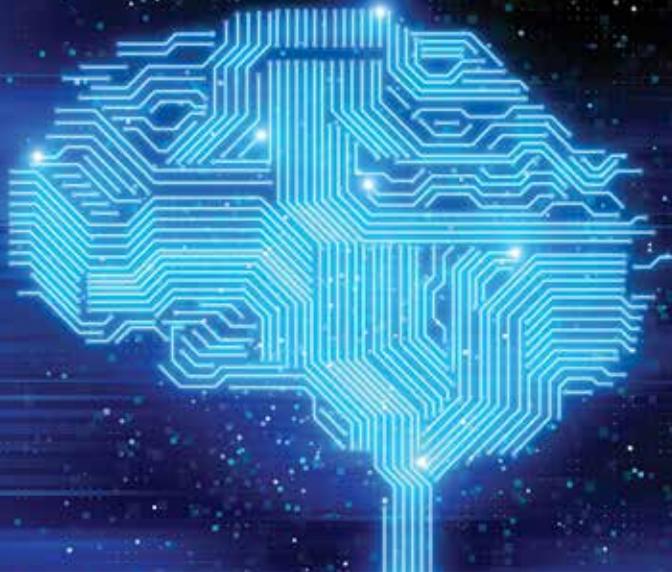
- **Scale.** A majority of the 7 billion people in the world now have access to the internet, most of them via mobile devices. Social media platforms have grown to reach vast numbers of users, challenging our ability to fully grasp their impact. Facebook now has more than 2 billion users. Twitter, operating in 40 languages and producing hundreds of millions of tweets every day, and YouTube, with users in 88 countries watching 4 billion videos daily and uploading 60 hours of new video each minute, have attained similar size and complexity.
- **Instantaneity.** In this hyperconnected environment, messages can travel quickly and virally throughout the world, which makes correction of falsity all the harder. The adage that “a lie gets halfway around the world before truth puts on its boots” seems truer today than ever.
- **Multiplicity of voices.** The many-to-many nature of social media that allows voices and opinions from anywhere and anyone has vastly expanded sources of information, for good or for ill. Everyone connected to the internet has, at least in theory, the ability to act as a producer as well as a consumer of content, and social media platforms are designed specifically to encourage and facilitate free expression. This has become an asset, especially to those who did not participate or were not heard previously. But this openness also increases the potential for the distribution of misinformation or disinformation, which has occurred in significant measure over the past few years.
- **Anonymity.** The ability to post anonymously has created an environment in which users do not easily know the source of information to which they are exposed. Hiding behind a screen of anonymity can protect the identity of dissidents but permits users to be less accountable for what they communicate. Furthermore, this is now a world where it is increasingly difficult to tell humans from artificial bots (see “Emerging Technologies”).

- **Insecurity.** When it was first conceived, the internet was intended only to link a relatively small number of users who knew and trusted one another. As it grew to global scale, the failure to build in security mechanisms has created vulnerabilities, subjecting users to repeated breaches that have compromised the personal information of tens of millions of users. And given the fundamental design of the internet, no easy fixes are apparent, even as the pace and scale of attacks continue to grow. Cybersecurity, then, is a continual arms race where hackers and preventive measures each advance in reaction to the other.
- **Attention scarcity.** In an environment rich in information, attention becomes scarce and valuable. In the face of the increasingly vast amount of information that an individual confronts every day, voices need to shout or be extreme to attract attention. A business model that is based on maximizing advertising revenues by maximizing the number of users encourages emotionally charged content, whether true or false. This can encourage sensationalism at the expense of the truth.
- **Big data and social engineering.** Because an unprecedented number of people now regularly share their attitudes and opinions online, they are contributing to a vast trove of personal information that major technology companies use to generate billions of dollars in advertising revenue. They optimize the appeal of their services and target groups that are likely to respond to specific messages. Some companies have developed social engineering techniques to keep people online as long as possible by personalizing content to maximize its appeal to each user. Critics have charged that this is creating addiction to digital content.⁶²
- **Filter bubbles and echo chambers.** One of the most effective and commercially successful techniques employed by data-driven, targeted advertising tools is personalization. This is a technique designed to promote content that appeals to “people like you.” One result of this technique is to provide users with content that reinforces their pre-existing views while isolating them from alternative views, contributing to political polarization and a fragmentation of the body politic. In turn, increasing political polarization encourages people to remain isolated in ever-more-separate ideological silos, offline as well as online.

The amplification (i.e., the widespread sharing) of ideas through various media is now a major activity within the information and media ecosystem. Ideas or memes can go viral instantly, for good or for harm. Furthermore, concentration of control of platforms by a relatively few companies raises potential problems, temptations and solutions. Gaining access to the platform allows one to reach incredible numbers of people almost instantly. Intervention by the platform can ban someone from this significant medium, but failure to intervene can allow harmful messages to spread unchecked.

This ongoing process presents opportunities for political engagement on both the institutional and individual level. But it also makes possible the weaponization of information in ways that promote conflict and confusion.

Thus, a perfect storm of technological, social and political forces has created a society where trust in democracy and in media are at historic lows. The next chapter lists specific reasons that may explain this loss of trust.



EMERGING TECHNOLOGIES

Today's new media environment is so recent that the world is just beginning to understand how it works and identify the issues that it raises. But this environment is a moving target. As technology continues to evolve, existing capabilities will get more powerful. Entirely new capabilities will appear, some beneficial, some that are problematic. Among many other impacts, these technologies are likely to influence how news is created, distributed and consumed.

Here are just a few of the emerging technologies that need to be tracked:

- **Virtual Reality (VR).** In the narrowband era, internet content was almost entirely text. With the arrival of broadband, video, audio and visually rich interactive games became increasingly prevalent. The next step in giving online content even more impact may be virtual reality, which offers highly realistic three-dimensional experiences. Some VR is created by the use of 360-degree video recording, while other VR is purely computer-generated. VR systems currently require wearing a headset but may soon be streamed directly through a web browser. Several news organizations have already experimented with providing VR news stories, and the format may become more common as the technology is adopted more broadly. VR can provide powerful experiences of “being there,” but applying journalistic best practices to it will be a considerable challenge, as news becomes less of a narrative account and more of a shared immersive experience.⁶³
- **Augmented Reality (AR).** While VR puts users into an immersive 3D world, AR extends computer-generated imagery into the real world. A recent example of AR is Pokémon Go, the popular smartphone-based game that projects game characters into a live image of the environment around the user using the phone's screen. Newer AR technology will employ glasses to project images directly into the visual environment. Publications such as *The New York Times* have begun to experiment with AR to deliver news to users “in the round, in front of you.”⁶⁴
- **Artificial Intelligence (AI).** Rather than the traditional coding technique that required skilled individuals to manually code each step in a program, AI uses tools such as machine learning to expose a computer to large amounts of data and allow the computer to make connections, generate insights and even make decisions (typically in a highly constrained domain of knowledge). After many years of research that yielded few practical results, artificial intelligence is emerging today as a practical tool in many fields.

AI programs are beginning to change the way journalists practice their craft. Newsrooms across the world are leveraging AI to enhance their capacity to identify emerging stories, to search for background information and to generate engaging digital assets. Already, AI programs are automatically producing news stories based on sports scores, election results and earnings reports derived from multiple real-time data sources. AI also plays a large role in selecting news that is distributed by social media platforms, including automatic identification of false stories. As news creation and distribution get more automated, we may need new standards and tools to judge its role.

- **Bots.** Automated programs that mimic human dialogue (a specific application of AI), bots can be useful tools. But bots can also be used to artificially boost attention to content and to manipulate perceptions of who and what is popular online. Bots are already in widespread use. According to Twitter, Russian forces deployed at least 50,000 bots on its platform during the 2016 U.S. election to help spread disinformation.⁶⁵ And the power of bots will continue to increase. A gathering of technology experts in 2017 predicted that as the capabilities of bots improve, it will become ever more difficult to determine which online posters are human and which are not. “Bots will become even more persuasive, more emotional and more personalized. They will be able to not just spread information, but to truly converse and persuade their human interlocutors in order to even more effectively push the latter’s emotional buttons.”⁶⁶
- **Media manipulation software (Deepfakes).** Programs such as Photoshop already make it possible to alter digital photographs in ways that are difficult to identify. Now developers are using digital technologies to create videos that are convincingly realistic but are not genuine. “Deepfake” technology allows users to place the voice and/or likeness of a person into a wholly different context to create false statements seemingly made by that person, or otherwise place him or her in a false light.⁶⁷ As this technology advances, it will be increasingly difficult to be able to tell whether audio and video content is real or synthetic.
- **Blockchain.** Invented to support cryptocurrencies such as Bitcoin, blockchain technology has broader potential uses by providing a decentralized ledger that can keep track of transactions of many kinds without the need for an intermediary or gatekeeper. Still in its early stage of development, blockchain may have meaningful uses in journalism,⁶⁸ including providing a mechanism to document the “provenance” of a news story while protecting the identity of a journalist who is operating in a repressive environment. Some news organizations have begun to experiment with blockchain applications.