

The Internet

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Why study the Internet?

- The Internet is a global phenomenon that is used by nearly 2.5 billion of people living on six different continents.
- The Internet is a constantly evolving technology that stimulates a seemingly infinite number of uses that continue to proliferate each day.

Introduction

There is no denying the significance of the Internet on human culture, as it has virtually infiltrated almost every aspect of society. The pervasiveness of this technology is illustrated by recent statistics, which reveal that nearly 2.5 billion people use the Internet throughout the globe (Miniwatts Marketing Group, 2012). Since its humble beginnings as a military project during the late 1960s, the Internet has emerged a crucial part of everyday life as people have come to rely on this technology for work, education, relationships, and entertainment.

So what exactly is this technology that has taken over our lives? According to Martin Irvine of Georgetown University, the Internet can best be understood in three components. It is “a worldwide computing system using a common means of linking hardware and transmitting digital information, a community of people using a common communication technology, and a

globally distributed system of information” (DeFleur and Dennis, 2002, p. 219). It is important to note, however, that the Internet does not act alone in providing us with seemingly endless information-seeking and communication opportunities. An integral part of this technology is the World Wide Web. While the Internet is a network of computers, the World Wide Web allows users to access that network in a user-friendly way. It provides an audio-visual format and a graphical interface that is easier to use than remembering lines of computer code, allowing people the ability to browse, search, and share information among vast networks.

The impact of the Internet on its users’ lives is widespread and diverse, as it influences the ways in which people understand salient issues in their lives, such as their health, government, and communities. It has disrupted traditional social conventions by changing the style of scope of communication performed by people in their interactions with friends and family, as well as with strangers. Further, it is becoming more apparent that the network structure of the Internet enhances individuals’ personal autonomy by allowing people to function more effectively on their own; it is no longer necessary for people to rely on physical institutions such as banks and post offices to perform daily tasks such as paying bills and sending messages (Rainie & Wellman, 2012). The scene at your local coffee shop in the middle of the day exemplifies this point, as patrons are seen hunched behind their laptops using public wireless Internet to perform job functions that were once accomplished in traditional office settings.

This chapter examines Internet technology by beginning with a review of its origins and rise to popularity. Next, recent developments in online marketing, social interaction, and politics will be discussed in relation to their impact on the current state of the Internet. We will conclude by briefly highlighting several issues related to the Internet that are anticipated to receive attention in future debate and research.

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Background

Though it is now accessible to virtually anyone who has a compatible device, the Internet began as a military project. During the Cold War, the United States government wanted to maintain a communication system that would still function if the country was attacked by missiles, and existing radio transmitters and telephone poles were disabled. The solution was to transmit information in small bits so that it could travel faster and be sent again more easily if its path were disrupted. This concept is known as packet-switching.

Many sources consider the birth of the Internet to have occurred in 1968 when the Advanced Research Projects Agency Network (ARPANET) was founded. Several universities, including UCLA and Stanford, were collaborating on military projects and needed a fast, easy way to send and receive information about those projects. Thus ARPANET became the first collection of networked computers to transfer information to and from remote locations using packet switching.

ARPANET users discovered that, in addition to sending information to each other for collaboration and research, they were also using the computer network for personal communication, so individual electronic mail (email), accounts were established. Email accounts allow users to have a personally identifiable user name, followed by the @ sign, followed by the name of the host computer system.

USENET was developed in 1976 to serve as a way for students at The University of North Carolina and Duke University to communicate through computer networks. It served as an electronic bulletin board that allowed users on the network to post thoughts on different topics through email. USENET then expanded to include other computers that were not allowed to use ARPANET.

In 1986, ARPANET was replaced by NSFNET (sponsored by the National Science Foundation) which featured upgraded high-speed, fiber-optic technology. This upgrade allowed for more bandwidth and faster network connections because the network was connected to supercomputers throughout the country. This technology is what we now refer to as the modern-day Internet. The general public could now access the Internet through Internet service providers (ISPs) such as America Online,

CompuServe, and Prodigy. Every computer and server on the Internet was assigned a unique IP (Internet Protocol) address that consisted of a series of numbers (for example, 290.152.74.113).

The theory of Diffusion of Innovation points out that people look for low levels of complexity in an innovation to determine whether or not they want to adopt it; in other words, they want to know how easy the innovation is to use. That qualification presented a problem for the early versions of the Internet—much of it was still being run on “text-based” commands. Even though the public could now access the Internet, they needed a more user-friendly way to receive the information it contained, and send information to others, that didn’t involve learning text based commands.

In 1989, Tim Berners-Lee created a graphical interface for accessing the Internet and named his innovation the “World Wide Web.” One of the key features of the World Wide Web was the concept of hyperlinks and common-language web addresses known as uniform resource locators (URLs). This innovation allows a user to simply click on a certain word or picture and automatically retrieve the information that is tied to that link. The hyperlink sends a request to a special server known as a “domain name server,” the server locates the IP address of the information, and sends that back to the original computer, which then sends a request for information to that IP address. The user’s computer is then able to display text, video, images, and audio that has been requested.

Today we know this as simple “point-and-click” access to information, but in 1989 it was revolutionary. Users were no longer forced to memorize codes or commands to get from one place to the next on the Internet—they could simply point to the content they wanted and access it.

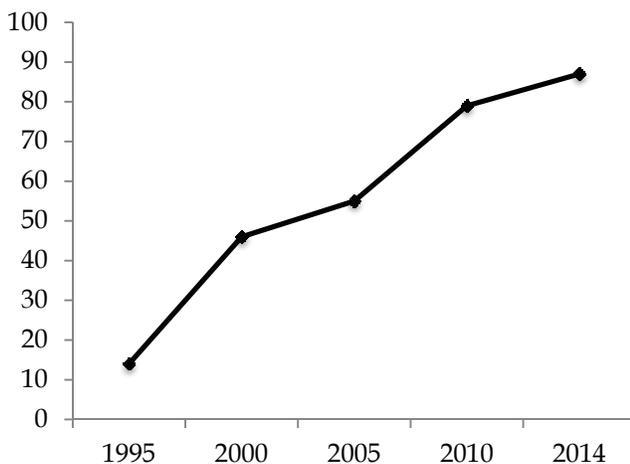
It is worthwhile at this point to explain the IP address and domain name system in more detail. The domain name (e.g, google.com) is how we navigate the World Wide Web, but on the back end (which we don’t see), the IP address—numbers—are the actual addresses. The Internet Corporation for Assigned Names and Numbers, or ICANN, is responsible for assigning domain names and numbers to specific websites and servers. With 1.6 billion users on the Internet, that can be quite a task (ICANN, 2010). To try and keep things simple, ICANN maintains two different sets of “top level domain” names:

generic TLD names (gTLD) such as .edu, .com, and .org, and country codes (ccTLD) such as .br for Brazil, .ca for Canada, and .ru for Russia.

IP addresses used to consist of a set of four numbers (e.g., 209.152.74.113), in a system known as IPv4. With 256 values for each number, more than four billion addresses could be designated. The problem is that these addresses have been allocated, requiring a new address system. IPv6 is the designation for these new addresses, offering 340,282,366,920,938,000,000,000,000,000,000,000 separate addresses (Parr, 2011). Without getting too detailed, it is doubtful that these addresses will be used up any time soon.

So what made the Internet so popular in the first place? During the late 1990s and the early 2000s, the Internet became one of the most rapidly adopted mass consumer technologies in history (see Figure 22.1). By comparison, radio took thirty-eight years to attract 50 million Americans, while the Internet took only four years to attract a comparable size audience (Rainie and Wellman, 2012). Advancements in hardware and software exist as primary factors that stimulated the widespread adoption of the Internet. Additionally, enthusiasm displayed by the U.S. federal government, which imposed minimal legal regulations on this technology, also contributed to early penetration of this technology.

Figure 22.1
Percent of U.S. Adults Who Use the Internet 1995-2014



Source: Pew Research, 2014

Internet growth in the early 2000s can also be attributed to consumers' attraction to certain Web features and applications. For example, online gaming, radio, instant messaging, health-focused websites, and pornography were all highly instrumental in enticing new Internet users (Rainie & Wellman, 2012). Retail shopping was another activity that attracted new users to the Internet, as businesses quickly capitalized on markets of consumers that preferred buying products online. It is worth emphasizing that the impact of the Internet on business and commerce has been significant. A new concept—e-commerce—was created to describe any transaction completed over a computer-mediated network that involves the transfer of ownership or rights to use goods or services. For example, if you purchase a song from iTunes you are engaging in e-commerce.

E-commerce is not to be confused with e-business, which is a different term that encompasses procedures for business that are conducted over a computer-mediated network, such as ordering new materials to aid in the production of goods, as well as marketing to customers and processing their orders (Mesenbourg, 1999). E-business and e-commerce continue to constitute prominent activities that engage Internet users, as both have emerged as established fields in business school curriculum and the workforce.

Recent Developments

Computer-Mediated Relationships

The Internet continues to be increasingly important for social interactions. Especially with the rise in social networking sites, people use the Internet to cultivate new relationships and to maintain existing bonds with friends and family. Computer-mediated interpersonal communications constitute a major area field of research, which ultimately reflects conflicting evidence as to whether the Internet enhances or is harmful to relationships.

Research concludes that several Internet activities such as game playing and social media can improve online and face-to-face peer relationships (Lai and Gwung, 2013). It is also suggested that online communication can have a positive influence on adolescents' sense of identity and the quality of their friendships (Davis, 2013). In regard to the parent-child social dynamic, there is some evidence that certain activities such as watching videos online can

enhance relationships (Lai and Gwung, 2013). However, the Internet has also been identified as a source of tension between parents and children, as growing concerns over safety have challenged parents to negotiate rules for monitoring and controlling their children's Internet use.

In terms of romantic relationships, research shows that the Internet can have varying levels of impact for couples in committed relationships (Lenhart & Duggan, 2014). Populations that are most influenced by the Internet included young adults ages 18 to 29, smartphone owners, and social network site users. Among these populations, the percentage of couples that said that the Internet positively impacts their relationship has declined over time, and the percentage of people negatively impacted has increased. While the Internet has undoubtedly provided more diversified channels for couples to communicate and cultivate intimacy, it also exists as a source of frustration and distraction, especially for younger adults and those in relatively new relationships.

Perhaps the most significant evidence of the influence of the Internet on romantic relationships can be recognized in the \$2 billion online dating industry that consists of more than 1,400 websites devoted to helping adults meet a partner. Results from a study conducted in 2013 conclude that one in 10 Americans have used an online dating site or mobile dating application, and an even higher percentage know at least one other person who has (Smith & Duggan, 2013). Among the most popular sites are Match, eHarmony, and Plenty of Fish; however, hundreds of other niche online dating sites have emerged that target specific religions, ethnicities, and other narrow demographic categories. According to journalist Dan Slater (2013), online dating has had a profound change on society by modifying our perceptions of commitment, as well as the potential for romantic chemistry to be determined by mathematical algorithms. Research reveals that attitudes towards online dating have become more positive over time, suggesting their increased prominence in the future of Internet use.

Social Networking Sites and Politics

Social networking sites have become an essential tool for political influence. Websites such as Facebook and Twitter have provided the technological infrastructure for people to organize and activate

massive political movements that have influenced significant events, such as elections and government upheavals.

In the context of electoral politics, social networking sites have become a standard tool in politicians' campaign toolboxes. They provide political candidates with an inexpensive means to spread messages and generate voter support in the months leading up to Election Day. Since their emergence during the 2008 United States election, the use of social networking sites has expanded significantly as candidates in the 2012 election maintained accounts on an array of sites such as Facebook, Twitter, Tumblr, and Instagram. Politicians used these platforms to collect information about voters such as their email addresses, geographic locations, and personal interests, which could subsequently be used to customize messages to be sent to individual voters (Bor, 2013). Evidence of political candidates' success in generating attention on social networking sites was confirmed by this research, which showed that nearly 40% of American adults engaged in civic or political activities using social networking sites during the 2012 election (Rainie, Smith, Schlozman, Brady, & Verba, 2012). These activities included posting thoughts about civic and political issues, encouraging others to act on issues and vote, or belonging to political or social groups working to advance a cause.

Beyond democratic elections, social networking sites have provided coordinating tools for political movements throughout the world. In commenting on the powerful role of social networking sites in civil society, Internet critic Clay Shirky (2010) explains, "As the communications landscape gets denser, more complex, and more participatory, the networked population is gaining greater access to information, more opportunities to engage in public speech, and an enhanced ability to undertake collective action."

Social networking sites such as Twitter and Facebook have proven to be an especially effective tool for citizens during political protests and revolutions because they can provide an efficient means for conveying warnings and updates about dramatically shifting ground events such as violent conflict and home evacuations. For more on social networking see Chapter 23.

Advancements in Online Marketing

With the ongoing changes in the online experience, the premises for Internet marketers are in constant flux. The sheer amount of traditional advertising messages on the Web has led consumers to develop an immunity against ads, causing the conversion rates for traditional advertisements to decline. Additionally, the growing focus on social connections that has been stimulated by the popularity of social networking sites has made it evident that marketing now requires a true two-way dialogue with consumers. It is not enough to write press releases or even to simply post advertisements to social networking sites. Marketers now have to identify conversations about their companies, products and competitors – and then actively engage in them. This “social listening” is part of the increased efforts to monitor and analyze the outcome of online marketing campaigns, which allows marketers to gain more information about potential customers and target their efforts to specific user groups.

A key factor in engaging with potential customers is content marketing. While the concept has been around for years, creating brand-specific content that actually has a value for potential customers has become even more valuable in times of online social media. A recent study revealed that content marketing produces three times more leads than regular marketing efforts, even outperforming paid search results on search engines (Eloqua & Kapost, 2012).

Current Status

Recent findings from the Pew Research Internet and American Life Project illustrate the remarkable growth in Internet adoption since the turn of the century (Fox & Rainie, 2014). According to their 2014 report, 87% of American adults use the Internet, and 71% of these users go online daily. While there was an increase in Internet use observed across all demographic groups, it is interesting to point out distinctions among certain user populations. For example, when comparing different age groups it is evident that younger adults are considerably more likely to use the Internet. The percentage of people between ages 18 to 29 who use the Internet reaches near-saturation at 97%; 93% of people ages 30-49 used the Internet; 88% of people ages 50-64 used the Internet; and only 57% of people over 65 years of age used the Internet.

Education level also appears to be a factor in predicting Internet usage (Fox & Rainie, 2014). More than 90% of people with at least some college education use the Internet, while only 76% of high school graduates or less use the Internet. When it comes to economic income, nearly all households (99%) with a reported income of \$75,000 or more are Internet users. This percentage steadily declines as household income decreases, but still 77% of households that make less than \$30,000 per year reporting using the Internet.

Other demographic categories such as gender, race, and ethnicity reflect minimal variation between groups. However, it is interesting to note that a gap still remains when comparing different ethnic groups’ broadband connections at home. A survey completed in September 2013 revealed that while 74% of white, non-Hispanic Internet users have high-speed Internet at their home, only 62% of black, non-Hispanic and 56% of Hispanic adults use high-speed Internet at home (Broadband Technology Fact Sheet, 2013).

In addition to tracking user penetration statistics, it seems equally important to understand what people are actually *doing* online. According to *The Digital Future Report* (2013) that conducts an annual survey of Internet trends and issues, Internet users go online to engage in four main activities which include: 1) communication services (i.e. checking email, instant messaging, posting on message boards), 2) fact-finding, information sources, and education (i.e. looking up a definition, distance learning), 3) posting information and uploads (i.e. posting photos, uploading music videos), and 4) information gathering (seeking news, looking for health information). Additionally, over the past decade there has been a significant increase in the percentage of Internet users making online purchases. In 2013, 78% of Internet users bought something online, with clothes and travel being the most popular items purchased (see Table 22.1).

Although Internet users generally agree that this technology has positive implications for individuals and society as a whole, a study of non-users reveals that 15% of American adults still choose not to use the Internet or email (Zickuhr, 2013). Among this percentage of non-users, irrelevance and difficulty in using the technology were reported as the top two reasons for Internet avoidance.

Table 22.1
**10 Most Popular Online Purchases
 in 2013**

Item(s) Purchased Online	% of Internet users who have purchased item online
Travel	66
Clothes	66
Books	63
Gifts	60
Electronics	51
Videos/DVDs	42
Computers/peripherals	40
Software/games	37
CDs	35
Products for hobbies	34

Source: The Digital Future Report, USC Annenberg School Center for the Digital Future

Factors to Watch

Privacy and Personal Data

With the increasing sociability and personalization of the Internet, protecting privacy online has become an important topic. The vast majority of Americans agrees that safe practices on the Internet are central not only to their own, but also the nation's, safety (National Cyber Security Alliance, 2012). And as more and more routine tasks (e.g. banking, social security administration, healthcare, bill payments) move online, the importance of safely handling personal data in an online environment will only increase in years to come.

The rise of social media has made personal information (such as photos, birth dates, addresses, and phone numbers) available to third parties. Oftentimes, this information is given away willingly by the individuals who control the information, or is collected by third parties without expressed consent. And while publicly posting vacation photos on Facebook might not seem like a serious privacy and security threat, the consequences can be severe. To exemplify, researchers have been able to successfully

predict individuals' social security numbers using publicly available data (such as Facebook profiles) and other over-the-counter software (Acquisti & Gross, 2009).

More than 85% of Internet users have taken steps to reduce the amount of data they make available online by setting stricter privacy settings in social networking sites, changing their browsing behaviour, or installing specific security software (Rainie, Kiesler, Kang, Madden, Duggan, Brown & Dabbish, 2013). Still, 59% of Internet users don't think it is possible to be completely anonymous online.

The Rise in Mobile Connectivity

The widespread adoption of smartphones has dramatically changed the way the Internet is used. Since 2009, the proportion of cell phone owners who use their phone to go online has doubled. And as of 2013, almost two-thirds (63%) of all cell phone owners use their phone to go online (Duggan & Smith, 2013). This shift from the stationary use of the Internet, which has been the standard for most of the Internet's history, is having a great impact on the way content is presented and consumed. Due to smaller screen sizes and different usage patterns (shorter, but re-occurring usage), the question becomes whether the information presented to mobile Internet users should replicate the regular Internet content, or if it should be an extension? The trend currently points towards a converged model, in which both worlds are closely related.

This convergence becomes especially important considering another trend in mobile Internet use: "leapfrogging." Leapfrogging refers to the process of obtaining Internet access by mobile devices only, and not through the more traditional way of a personal computer (Napoli & Obar, 2013). This is an especially salient trend among minorities and economically disadvantaged populations that often do not own a personal computer, and only use cell phones to go online. For 21% of the total cell owner population, going online has become the main use of their mobile phone (Duggan & Smith, 2013).

To conclude, the Internet is clearly a constantly evolving technology that will continue to be used by humans in new and creative ways. A survey revealed that the importance of the Internet for its users continues to increase over time, as more than half of Internet users in 2013 claimed that the Internet would be, at a minimum, "very hard" to give up

(Fox & Rainie, 2013). While its capacity to make life easier remains debatable, the Internet unarguably makes information and communication more acces-

sible. It will be important to continuing monitoring the unanticipated outcomes of Internet use, and to analyze the influence of these behaviors on society.

The Internet Visionary: Tim Berners-Lee

Tim Berners-Lee is credited as being the inventor of the World Wide Web. As explained in this chapter, the World Wide Web is the code system that makes it simpler for people to navigate the mass network of linked computers that make up the composition of the Internet. As a British computer scientist working at the European Particle Physics Laboratory CERN in 1989, Berners-Lee wrote a paper proposing an “information management system” that would eventually become the conceptual and architectural structure for the Web. A year later in 1990, he released the code for this system free for the world.

Since its initial inception, Berners-Lee has continued to play an active role in the technical development and expansion of the Web. He is the founder of two leading Internet authorities—the World Wide Consortium (WC3) and The Web Foundation. Initially launched at Massachusetts Institute of Technology (MIT) in 1994, WC3 works with the world’s leading academic institutions and software developers to determine standards for all Web infrastructure. In 2009 Berners-Lee founded the World Wide Web Foundation, which strives to oversee the spread and ethical application of the Web, and to ensure that this technology is being used throughout the world to empower humanity mediate positive change.

Berners-Lee remains an enthusiastic supporter of Internet freedom and the importance of recognizing human rights on the Web. In light of recent controversy regarding government censorship and surveillance, Berners-Lee launched the “Web We Want” initiative. This project aims to create a universal “Internet Users Bill of Rights” that would establish clear rights to Internet access and provide defined protections for personal user information. Looking to the future, Berners-Lee recognizes that society’s increased reliance on the Web also raises the potential for abuse of this technology. Ultimately, he envisions that a more mature Web will continue to emerge that will ultimately empower users by giving them the tools to further enhance the personalization of their Web experiences.

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