

Name: _____ Class: _____

How the Internet Came to Be

By Shelby Ostergaard
2017

The Internet is a tool used by countless people across the world, but how well do they understand how it developed? In this informational text, Shelby Ostergaard explores the development of the Internet and how it came to be the tool we use today. As you read, take notes on how different projects led to the development of the Internet.

[1] The Internet powers the whole world. It's used every day by people all over the globe. In fact, according to the World Wide Web Foundation, there are over one billion websites. On any one day, billions of users have searched Google three and a half billion times and sent 155 billion emails. Those numbers keep growing as more and more people connect. The Internet is the backbone of the 21st century and will likely remain an important part of our social, political, and cultural lives. Because of this, it is vital to understand some basic things about the Internet, like who created it and why.



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The Internet is the world's most popular computer network system. It is used by over three billion people around the world. A computer network system is a telecommunications¹ network that allows different computers to connect and share data. Data shared by different computers over the Internet encompasses all sorts of things — from the last thing you typed in a Facebook chat window to the programs that run Google's search engine.

The Internet isn't owned by anyone, and it was not really created by any one person. Instead, lots of computer scientists contributed to various projects at corporations and academic institutions, which, when all combined, eventually led to the Internet as we know it. Bite-sized collaboration is the nature of computer science. But while the Internet has no clear creator, it does have a clear starting point.

The Internet began as ARPANET,² an academic research project funded by the US Department of Defense. The idea stemmed from computer scientists Donald Davies, Ivan Sutherland, and Bob Taylor, who wanted to create a computer network using new packet switching technology. Packet switching technology packages data into small bunches, called packets, and then allows those packets to travel from a computer at one location to a computer at another. The route the packets take does not have to be linear or straight, and data can be sent to multiple computers and multiple locations at once.

1. communication over a distance by cable, telegraph, telephone, or broadcasting
2. Advanced Research Project Agency Network

- [5] Before packet switching technology, the only way to build a network was to use circuit switching. A network setup with circuit switching technology created a dedicated channel, or circuit, for data to directly travel from a device at one location to a device at another. The data had to travel across that path exactly and could only be accessed by one of the two devices in the circuit.

Bob Taylor explained the difference in a 1999 New York Times “On the Web” article, remembering when, in late 1965, he used to have three separate computer terminals for three separate communications, “If I was talking online with someone at S.D.C.,³ and I wanted to talk to someone I knew at Berkeley, or M.I.T.,⁴ about this, I had to get up from the S.D.C. terminal, go over and log into the other terminal and get in touch with them” he recalled. Those three separate computer terminals were each part of three separate computer networks set up using circuit switching technology. Data could only be shared between two devices directly. But Bob Taylor wanted to set up a computer network using packet sharing technology. He remembers that, “I said, ‘Oh Man!’, it’s obvious what to do: If you have these three terminals, there ought to be one terminal that goes anywhere you want to go. That idea is the ARPANET.”

When Bob Taylor said “talking online with someone at S.D.C.” in 1999, he both meant the same thing and a very different thing than we do now. He meant he was talking to someone over a computer and that he was typing text, not speaking out loud. Back then his text was sent directly to that other computer, and only that computer could ever see it. Now when we say you are talking to someone online, we mean that you are sending text through a computer network. The computer that you are using can access it, and so can your friend’s. But if you logged off Facebook and pulled out your phone? Well, you can access that text there too. The difference between the two is what was so revolutionary about ARPANET.

In 1969 four computers were successfully connected to ARPANET, creating a computer network. Things progressed quickly after that. More and more computers were added to ARPANET, and by 1972 computer scientists began to develop applications that worked over the network. One of these applications was email, called electronic mail at the time.

Another of the applications developed, although later than email, was the World Wide Web. The World Wide Web was invented by Tim Berners-Lee in 1989 and it is the application used to create and view websites. It’s also where the www. prefix of web addresses comes from. The World Wide Web is one of the primary tools that Internet users interact with.

- [10] The World Wide Web allowed for the exchange of web pages. These are primarily text documents, but they are not written in a language people speak. Instead, they’re written and formatted in Hypertext Markup Language (HTML), which allows the computer to read the text and display it properly. HTML also allows the computer to ‘read’ images, video, audio, and software components and to display those properly as multimedia on the page. Web pages have unique names; embedded hyperlinks allow users to jump from one uniquely named web page to another, thus creating a web of pages. The Internet as we know it did not really exist until the applications associated with the World Wide Web application came into wide use.

3. Systems Development Corporation

4. Massachusetts Institute of Technology

In fact, many users of both the Internet and the World Wide Web have a tendency to think that the two are the same thing. They aren't. The Internet is the world's largest computer network system. The World Wide Web is just one type of application used on the Internet. It is one of the most popular applications used on that computer network, but it is not the only one. The Facebook or Instagram applications on your phone are applications that share data using the Internet but do so without the World Wide Web, hence there are no web pages. However, the Facebook and Instagram website you can access on your computer are web pages that use the World Wide Web application.

The Internet was created with the goal to make it easier for computer scientists to talk to one another. But it also made it easier for everyone else to talk to one another, through the creation of popular applications, like email and the group of applications that make up the World Wide Web. The Internet wasn't really created by anyone and it is definitely not owned by anyone. Or, depending on how you look at it, the Internet is owned by everyone.

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Text-Dependent Questions

Directions: For the following questions, choose the best answer or respond in complete sentences.

1. PART A: Which of the following best identifies the main idea of the text?
 - A. The Internet reached its peak development at packet switching, and has not changed significantly since then.
 - B. The Internet was initially created with the goal of allowing people to connect with their friends and family around the world.
 - C. The Internet was initially developed for limited communication among a select few, but since then it has evolved dramatically and is accessible by all.
 - D. While many people have contributed to the creation of the Internet, the most important contributor was Tim Berners-Lee.

2. PART B: Which detail from the text best supports the answer to Part A?
 - A. "The data had to travel across that path exactly and could only be accessed by one of the two devices in the circuit." (Paragraph 5)
 - B. "When Bob Taylor said 'talking online with someone at S.D.C.' in 1999, he both meant the same thing and a very different thing than we do now." (Paragraph 7)
 - C. "The World Wide Web was invented by Tim Berners-Lee in 1989 and it is the application used to create and view websites." (Paragraph 9)
 - D. "The Internet was created with the goal to make it easier for computer scientists to talk to one another. But it also made it easier for everyone else to talk to one another" (Paragraph 12)

3. What distinction does the author draw between packet switching and circuit switching?
 - A. Circuit switching and packet switching are different ways in which information can be accessed on multiple computers at once.
 - B. Packet switching allows a wireless connection while circuit switching requires a physical connection.
 - C. Packet switching allows information to be accessed on multiple computers, while circuit switching can only share data between two computers.
 - D. Circuit switching allows information to be accessed on various computers at the same time, while packet switching is the communication between two computers.

4. How do paragraphs 9-11 contribute to the author's explanation of the Internet?
 - A. This section explains the distinction between the World Wide Web and the Internet, which addresses a misunderstanding many users have.
 - B. This section criticizes the creators of the World Wide Web for creating a complex language for writing web pages on the Internet.
 - C. These paragraphs establish that the World Wide Web is a computer network system, while the Internet is an application people use on the World Wide Web.
 - D. This section illustrates how the World Wide Web is superior because, unlike the Internet, it can be used without a connection to a computer network system.

5. How does the author support her claim that the Internet “wasn’t really created by anyone” (Paragraph 12)?

Discussion Questions

Directions: *Brainstorm your answers to the following questions in the space provided. Be prepared to share your original ideas in a class discussion.*

1. Before reading this article, how did you think the Internet worked? How did this this article affect your understanding of the Internet?
2. What do you think would happen if one person was responsible for the development and maintenance of the Internet?
3. In your opinion, why is it important to understand how the Internet came to be?
4. In the context of the text, how do people benefit from the Internet? In what ways does the Internet present new problems? How do you think the benefits of the Internet compare to the costs?
5. In the context of the text, what should the future look like? How could additional development of the Internet affect the future? What could be the costs and benefits of this?