



PENGUIN READERS



The Story of the Internet

Stephen Bryant

Introduction

'This software's going to change everything. Soon everyone will be using it,' Marc Andreessen said.

Marc was only twenty-three years old, but already he had a good reason to be confident. A few months before, he had written a program called Mosaic. Now two million people were using it.

At the time when Marc Andreessen said that his software was going to change everything, the Internet was just a hobby for most of the people who used it. The Internet was not easy for ordinary people to use, and business people said that no one made money from the Internet. But the same thing had been said about the first cars – before there were good roads. They had said that you could not sell telephones when there was no one to call.

The Internet today is a product of millions of different computers; the history of the Internet shows how the work of many different people – scientists, engineers, soldiers, business people – can create something that none of them planned.

The Internet began in the US as a very small part of the struggle between the US and the Soviet Union in the Cold War. It then grew because people wanted to do new and different things with computers – to send messages, to work together, to find information, to discuss ideas, and to share music and pictures.

Now each year brings a new big idea that changes people's lives. Google searches four billion web pages. On eBay you can buy or sell almost anything. YouTube lets anyone produce their own video show. Facebook and MySpace connect millions of people all over the world, providing places to chat, share interests and even get married. In the twenty-first century the Internet will change the lives of almost every person on the planet. This is its story.

Chapter 1 Sputnik

Until the evening of 4 October 1957, the US President, Dwight D. Eisenhower, was confident that he led the world's greatest nation. In the USA, the early 1950s are known as the Eisenhower years. Many Americans remember these years as a time of wealth and happiness. The USA was the richest nation in the world and it was growing richer all the time. Almost every American could hope to own a house and a car. As a general, Eisenhower had led US armed forces to victory in the Second World War and, until that evening in 1957, it seemed that no other nation could threaten the USA.

But then some news arrived that shook America's belief in itself: 'The Russians are in space! The Russians are in space!' Until this moment Americans believed that their nation was the most powerful on Earth. But now the Soviet Union had gone beyond the Earth.

Millions of radios all over the world could hear a new broadcast: 'Beep...beep...beep...' This electronic noise was the sound of the satellite Sputnik 1, the first object placed in space by humans. It was a Russian achievement and it shocked Americans.

This was the time of the Cold War. The Soviet Union was America's great enemy, and soldiers from both sides stood ready to fight in almost every part of the world. The risk of real fighting – a 'hot' war – was always present. But the Cold War was not just about armies and weapons. It was also a war of technology and ideas. Each side presented its successes in science and technology as proof that its political system was better.

So when the Soviet Union sent its little silver satellite up into

the cold night sky of the Kazakh Republic, it was more than just an interesting scientific test. It was an act that showed the world that the Soviet Union was winning the war of ideas. Sputnik measured just fifty-eight centimetres across. But every ninety-six minutes it crossed the skies of the USA like a new moon – a Russian moon.

Americans were worried. If the Russians could put a satellite into space, what else could they do? Soon they might send platforms into space as well, and drop bombs from them, right into the heart of the nation. Newspapers were soon filled with wild stories about the new dangers in space. Many Americans believed them.



‘What are we going to do about this?’ President Eisenhower asked his Secretary of Defense, Neil McElroy.

‘There’s no real reason to worry,’ McElroy replied. ‘Sputnik is not a danger for us. Our scientists are better than their scientists.’

‘I know that,’ said the President. ‘That’s not what I’m worried about. My problem is that I don’t like surprises. I don’t want to be surprised like this again. The nation doesn’t want to be surprised like this again. In future we will make sure that we are ahead of the Russians in all important technologies.’

‘What are you suggesting, Mr President?’

‘We need a new department of government to direct our high-technology work. I want to be able to say to the American people, “Don’t worry. The best scientists in the world are working for the US government and they’re keeping us ahead of the Russians.” And I want to stop the armed forces competing with each other, the way they do now. It’s a waste of money and talent. I want a single organization to control all our high-technology efforts.’

‘Yes, sir, Mr President,’ said McElroy.

The Secretary of Defense did not know it, but as he turned and walked out of the famous Oval Office, he was taking the first steps on a road that led to the most important invention of the late twentieth century: the Internet.

Chapter 2 The First Computer Network

On 7 January 1958, President Eisenhower announced a new organization called ARPA that would control all of the government's high-technology work.

Soon ARPA was spending millions of dollars on research into new science and technology. In lonely laboratories deep in the deserts and mountains of the USA, brilliant men and women explored extraordinary new ideas. Scientists built bombs that could spread terrible diseases. Engineers made plans for wars in space. Psychologists tried to train people to communicate through the power of thought alone.

ARPA's earliest projects were aimed at winning the 'space race' that Sputnik had started. But these projects were soon placed under the control of a new organization, NASA. NASA captured America's imagination all through the 1960s, especially after President Kennedy announced his plan to land a man on the moon.

While NASA filled the news, ARPA was working quietly in an area that would eventually prove far more important than space travel: computing.



In 1966, the man in charge of ARPA's computer projects was Bob Taylor. He began his career as a scientist working on brain research. But he was also interested in computing, even before

computer science existed as a separate area of study. Computers were still a very new technology at this time. They were less common than Rolls-Royce cars – and more expensive. In the 1960s, a computer with the power of the machines that sit on desks today cost millions of dollars and was the size of an apartment. Most of these machines were owned by universities, the government or large companies. They were mainly used for mathematics.

But even at this time, Bob Taylor realized that computers were not just machines that could calculate. They were machines that could communicate as well.

ARPA was paying for computer projects at universities all over the USA. But Bob Taylor was not happy with the results. He went to see his boss, Charlie Herzfeld:

‘Charlie, we’ve got a problem,’ he said.

‘What’s that?’ Herzfeld asked.

‘We’re throwing money away,’ said Taylor. ‘We’re paying different people all over the USA to do exactly the same work.’

‘What’s wrong with them?’ shouted Herzfeld, who had a strong Austrian accent and frightened many of the people who worked for him. ‘Haven’t they heard of the telephone? Don’t they go to conferences? We pay for them to go to conferences. Why don’t they just tell each other what they’re doing?’

‘No, Charlie, that’s not the problem,’ explained Taylor. ‘Of course our people talk to each other. The trouble is that their computers don’t.’

‘Their computers don’t talk? What do you mean?’ asked Herzfeld.

‘Well, look at my office. I’ve got connections there to all of our biggest computers. But if I want to communicate with the people at Santa Monica, I have to sit down at one machine. And if I want to talk to the computer at Berkeley, I have to get up

from that machine and go over and sit at another one, using a completely different computer language. It's the same for all the other computers.'

'So what's the answer, then?' asked Herzfeld.

'I want to build a network of computers. I'd like to connect four of our biggest computers together. Then the scientists can share their research and we won't be paying for the same jobs again and again.'

Herzfeld looked at Taylor for a moment.

'Isn't that going to be difficult?' he asked.

'Oh, no,' said Taylor, sounding more confident than he felt. 'We already know how to do it.'

Herzfeld thought for a moment.

'Great idea, Bob,' he said. 'Start working on it. I'll give you a million dollars right now. Go.'

Taylor left Herzfeld's office and went back to his own room. 'A million dollars!' he said to himself. 'And that only took twenty minutes! Why didn't I ask for more?'



When Bob Taylor had the money for a network, he began to hire people to build it. His first choice for a manager of the project was Larry Roberts.

Roberts was perfect for the job because he was an expert in both computers and communications. He had just succeeded in linking two computers on opposite coasts of the USA. Bob Taylor had paid for this work and now he wanted Larry Roberts to go to work at ARPA. The problem was that Roberts did not want to come. He was happy where he was – Lincoln Laboratory at the Massachusetts Institute of Technology (MIT).

Taylor went to see Charlie Herzfeld again: 'Isn't it true that ARPA is giving Lincoln at least 51 per cent of its money?'