



## Program Summary

# THE DEATH OF DISTANCE: HOW THE COMMUNICATIONS REVOLUTION WILL CHANGE OUR LIVES

Based on a Presentation by Management Forum Series Speaker

**Frances Cairncross**

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## Introduction

Imagine what our society would look like today without the invention of the personal automobile. People would not be living in suburbs, commuting long distances to work, to go shopping, to partake in entertainment, go on vacations, etc. We had no idea how the automobile was going to affect these aspects of society when it was first invented and introduced. It just evolved to where it is today for better and worse.

Now imagine how the new transport revolution – the Communications Revolution – affects our future. What will society look like and how will we function? This picture is one we are responsible for forming in order to create a positive integration of technology whose effects are more often better than worse.

Frances Cairncross' presentation provided the foundation to recognize patterns of change and opportunities for the future. This program summary recaps:

1. The three transport revolutions;
2. The Communications Revolution technologies;
3. Four main areas of impact of the Communications Revolution;
4. Problems of the Communications Revolution; and
5. Communications Revolution winners.

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**Frances Cairncross** is a senior editor on the staff of *The Economist*, where she has worked since 1984. She has had responsibility for the Britain section and for coverage of the environment and, most recently, of media. Her first book was entitled *Costing the Earth: The Challenge for Governments, the Opportunities for Business*. Her latest book, *The Death of Distance*, published by Harvard Business School Press, looks at the convergence of technologies and how those technologies make the concept of geographic distance obsolete.

Cairncross is a graduate of Oxford University and Brown University. She is a governor of Britain's National Institute of Economic and Social Research; a member of the Council of the Institute for Fiscal Studies; an honorary fellow of St. Anne's College, Oxford; and a non-executive director of the Alliance & Leicester Group. She is married to Hamish McRae. They have two daughters and live in London.

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*More than any other factor, technological change is what shapes our world. It will alter our lives, it will alter the way we think.*

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## Three transport revolutions

The importance of technological change is absolutely enormous, and the current wave of technological change is the fastest the world has ever seen. It is nothing short of a revolution.

Today's change can be put into perspective by quickly reviewing the three transport revolutions. The revolutions came about as costs involved in the respective functions of each technology dropped enormously as a result of the technologies involved.

### Goods

The first transport revolution occurred in the 19th Century, and consisted of a dramatic change in how goods were transported. The cost of transporting goods from one nation to another, from one continent to another was prohibitively expensive until the 19th Century and the invention of steam-powered ships and railroads. Homes in Britain, for example, used expensive, imported mahogany woodwork in rooms where guests might be entertained, but in the *living* sections cheaper pine woodwork was used throughout. The simple fact was that the cost of importing mahogany from across the oceans was simply too expensive to be affordable.

However, once steamship technology was adopted, the cost of transporting fine mahogany (or any other foreign or exotic commodity) plummeted. Similar transportation costs tumbled in America with the widespread use of steam-powered railroads, which facilitated the expansion of industry and population into the interior territories of the United States.

Perhaps the biggest impact of the 19th Century revolution in the cost of transporting goods revolved around the cost of transporting food. Steamships hauling grain from America virtually sustained the population growth

in Europe during the 1800s. The cost of transporting goods exported from the United States in 1915 was less than 10% of what it had been 100 years before, in 1815.

### People

The second transport revolution occurred in the 20th Century. This second revolution related to the cost of transporting people. Mostly, the automobile and airplanes brought about this great revolution. The cost of an automobile dropped so much that it changed from a toy of the rich to a necessity of everyday life for the masses. Proliferation of the use of the automobile actually changed the landscape of America in that suburbia was spawned. Inner cities ceased being centers of living and evolved almost exclusively as commercial hubs.

Also, air transportation has had its impact. For example, the cost of a one-way ticket from New York to London in 1950 was \$2,500 (in comparable 1998 dollars). By 1998, however, the cost had dropped to about \$500, a drop of 80%.

The transport revolution affecting people, of course, led to the creation of the mass tourism industry, and all the jobs that accompany it. Mass migration has also been made possible.

### Ideas (Communications)

The third transport revolution, that of the 21st Century which we are just now beginning to experience, is

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*This revolution is the key to future economic growth and is about communicating information, ideas, knowledge.*

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that of ideas. By ideas, Cairncross means communicating information, particularly over long distances.

For example, Cairncross pointed out that the cost per year of an Intelsat circuit dropped from \$6,500 in 1970 to \$500 today, a decline of more than 92%.

One of the characteristics of this revolution of ideas is that it turns innovation into a game that everyone around the world can play.

## Communications revolution involves three old technologies

This 21st Century revolution of the transport of ideas involves the convergence of three old technologies: the telephone (invented in 1876), television (invented in 1926) and the computer (invented in the mid-1940s). But technological advances in each of these arenas has led to the convergence of the three technologies to transport ideas as digital information, and the ability to shift from analog to digital has resulted in plummeting costs.

### Telephone

Relatively recent technological advances in telephony have been the introduction of greatly increased capacity in the form of fiber optic cables and the introduction of mobility in the form of wireless telephones.

Fiber optic cable facilitates both transmission of digital data and greater capacity for broadband voice communications. In 1956, the trans-Atlantic cable had the capacity to carry 89 simultaneous conversations; the fiber optic cable laid across the Atlantic in 1988 had the capacity to carry 40,000 simultaneous conversations; and the cables that will be laid in the next year or so will carry more than 3 million conversations at one time.

In short, the cost of a three-minute trans-Atlantic telephone call has declined from \$234.74 in 1930 to \$2.25 today.

The advent of wireless phones has added mobility to telephone communication. Use of wireless phones has been made possible by two technological innovations: satellite technology and the steep fall in the cost of computing power.

Another innovation that changes the way telephones are used, developed just this decade, is the Internet –

“*The mobile telephone may arguably be the most successful new way of communicating that the world has ever seen. For conversations, people will come to use mobile telephones almost exclusively.*”

people connecting computers together using telephone lines.

### Television

Although invented in 1926, television is a post-World War Two phenomenon. At the end of the war, a mere 8,000 homes worldwide had television sets. By 1996, that number had risen to more than 840 million – two thirds of the world’s households. Technology of television has changed little in the past 50 years: the introduction of color in the 1960s, and adoption of coaxial cable a little later.

Color did little but add to the picture quality of TV, but coaxial cable added to the channel capacity, from a few over-the-air channels typically available to viewers to 25, 50, or even 100 over coaxial cable. Now, with fiber optic cable being adopted, the capacity in terms of television channels reaches into the several hundreds.

But satellite technology has changed the timeliness of medium.

“As recently as the 1970s, more than half of all television news was at least a day old,” Cairncross said. “Today, almost all news is broadcast on the day it occurs. Big events such as the fall of the Berlin Wall or the Gulf War, go out to billions of viewers as they happen.”

### Computer

The third old technology that is contributing to this new revolution in the transporting of ideas is the computer, and specifically the networked computer. Two innovations have changed its impact: miniaturization and the interconnections of computers through the Internet

and its various forms (e.g., Intranets).

“A state-of-the-art IBM computer in 1967 cost \$167,000, and could hold 13 pages of text,” Cairncross said. “Since then, the computer has been miniaturized and has become a consumer durable, with computing power embedded in everything from automobiles to children’s toys.”

Computing power of a chip has doubled every 18 months to two years since 1965. By 2006, according to forecasts from Intel, chips will be 1,000 times more powerful and will cost one-tenth as much as they did in 1996. As computer size has fallen, computer capacity has risen. These developments have affected both telephones and television.

Availability of mobile phones has been made pos-

sible by these advances in computers. Creation of “set-top-boxes” that decode encrypted television signals has fostered greater use of multiple television channels.

The Internet was developed by the Defense Department’s Advanced Research Projects Agency in the 1960s to overcome the capacity limitations of computers of that time. Its creation of the Transmission Control Protocol/Internet Protocol (TCP/IP) provided a common language for all computer platforms.

These transformations have had three main consequences: 1) a vast multiplication of computing power; 2) development of a working model of a “global information superhighway (the Internet); and 3) the Internet has given birth to a vigorous new industry dedicated to developing ways to use it and services to sell across it.

## Impact of the Communications Revolution

The ideas revolution, or as Cairncross also referred to it as the Communications Revolution, will impact four distinct arenas: 1) commerce and companies, 2) the economy, 3) society and culture, and 4) government and the nation state.

### Commerce and Companies

One fallout on commerce and companies will be the diminishing importance of location in the conduct of business. This is the most fundamental change.

Because of the Internet, physical geography matters less, and time zones matter more.

Companies are actually beginning to relocate in areas where they can best communicate with all points on Earth simultaneously. Perhaps the best location for such activity is in Western Europe because communications conducted at noon in Europe coincides with early morning in the Far East and late afternoon in the Western Hemisphere.

This need to conduct work across large segments of the globe inevitably will lead to a three-shift world – Europe, the Western Hemisphere and Asia.

The logical outcome of this work paradigm is that business thinking will be focused on accessibility, not distance.

Another impact on commerce will be that companies have greater global reach and more local provision. That means that there will be a world market for small firms, and those markets will be borderless, meaning that mar-

kets will no longer have geographic boundaries. These changes will lead to the creation of new relationships between customers and businesses based upon greater trust.

The new relationships will be fostered by an enormous collection of data about customers, and that data will lead to customized content of products.

This new marketplace will result in what Cairncross calls “more minnows, more giants.” By this she means that the size of a company is irrelevant when it comes to doing business worldwide, that even a small firm run from a spare bedroom can do business anywhere in the world through the Internet.

At the same time that small niche businesses are

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*The amount of data collected by new technologies like the Internet will be so great that the challenge for businesses will be to determine which data actually are important and which are rubbish.*  
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*The ability to conduct business through the Internet has enormous economic importance in the long run because it makes markets more efficient, and there will be an infinity of little niche (businesses).*”

flourishing, at the other end of the scale there are forces driving concentration. Among the things where concentration will be found are those businesses that involve networks, business that few people ever realized before were network businesses. The bigger the network the more valuable it is. Examples of these types of businesses are cash dispensers (ATM machines) which are networked. “Banks are finding that the ATM business is actually a separate business, with its own revenue stream, from the banking business,” said Cairncross.

Brand recognition will become more and more important in the worldwide marketplace; therefore great efforts will be made to promote brands with celebrity boosters.

Finally, the rise of what Cairncross calls “Hollywood Company” structures will emerge. Hollywood Company structures are characterized by the companies serving in the role of bankers, with key employees being treated as stars commanding higher and higher compensation. Other employees will become independent “e-lance” contractors. An “e-lance” employee is, essentially, a free-lance employee who works electronically.

## **The Economy**

The impact of this new revolution on the economy will have three dimensions. First, output will become more intangible in that manufacturers will emerge as service providers, and services will be seen as manufacturing. In such a shifting environment, measurements become muddled. Measuring outcomes will become very hard to do.

“One outcome will be that ordinary people will have access to services that, once upon a time, were available

only to the rich – really good banking, really good stock brokering, really good health care.

A second dimension of the impact on economy will be that competition will spring up in new areas as new, near-frictionless markets emerge, and at the same time profit margins will be squeezed like the world has never seen before.

These new markets will begin trading intangibles in service areas such as health and education that can be traded on line, which will have an effect on the public sector.

A third dimension of the impact on economy is that incomes will converge globally, diverge nationally. By that, Cairncross means that the job market will become a global market with a new star system developing with the identified stars being paid enormous sums. For example, “there has been an uproar in Britain for the past week because a senior executive of the Bank of America has come to Britain to rescue one of Britain’s main bank, Barclays. And he’s being paid about \$8 million, which is unheard-of for a British C. E. O,” but not uncommon in the United States.

The underlying truth of these dimensions is that knowledge becomes supreme.

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*Knowledge is the basic building block of growth and human welfare. It is knowledge that makes us free and it is knowledge that makes us rich. This revolution is actually going to make knowledge available to more people around the world than ever before.*”

## Society and Culture

The revolution's impact on society will be threefold. First will be the changing role of the home. In our lifetimes, the home has been a place of recreation. In the future, in addition to recreation, homes will be places of work and places where health care will be delivered. This, of course, will have significant effects on the design of homes.

The second impact on society and culture will be the rise of new communities. Communities will be more horizontal and based on common interests communicated through on-line media, and less vertical, i.e., based on geographic location.

The third impact on society and culture is that English will become the global standard language. It is fast becoming that already. This adoption of English is a result of America's dominance of the Internet and other communications.

## Government

The ideas revolution's impact on government (and the nation state) will have four dimensions. First, will be a new balancing of political power, with power moving in two different directions. On one hand power will be moving up in that international standards will be adopted more and more.

“Certainly governments will acquire the technological capability to isolate and track every movement of those citizens it regards with suspicion, and this surveillance power will be a serious potential danger to liberty, especially as countries without Western respect for human rights acquire Western networks and computers.”

On the other hand, a far more likely development will be a reduction in the authority of government as power will move downward to the individual. Such a shift of power will both reinforce democracy and transform it, Cairncross said.

The second impact on governments will be a new service revolution in government. That is, that governments will be more into efforts that provide services to citizens than they will be enforcing restrictions on citizens.

The third impact on governments will be a competition for citizens. Increasingly, people will be working in on-line capacities and have the ability to live anywhere they want. It is likely that they will gravitate to areas that have the lowest taxation. The keys of success for govern-

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*Everywhere, free communications will change the balance of power between governments and their citizens. People will be able to become better informed – even though most governments are no more enthusiastic about putting information into cyberspace than they were about publishing it in more traditional ways. People will be able to communicate their views on their rulers more easily.*

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ments will be the packages they provide to citizens in regard to the amount of services provided for the taxes paid. Already, the Swedish government is losing citizens who are the fleeing high taxes of that country.

Finally, we will see the rise of niche states. Smaller countries (in terms of population) stand to fare well in this climate. Those countries with smaller populations can offer better education to its citizens who can command better incomes from specialized work. There really will be no advantage to living in a country with a large population.

# Communications revolution faces problems

The ideas revolution cannot come about without confronting three basic problems: 1) affordable access, 2) industry structure, and 3) the five 'P's.

Affordable access is one that industry must resolve, and involves cost of systems, convenience of the systems to the users, and the culture of societies to adapt to the systems.

The problem of industry structure is one governments must solve, and they involve such things as regulations, providing an environment that fosters competition, and carefully monitoring concentration of technologies to avoid runaway monopolies.

The five 'P's are 1) policing, 2) pornography, 3) privacy, 4) piracy, and 5) property. These are problems that fall in the lap of everyone, individuals, governments and industries.

Unanswered questions remain about how do governments police people who will not abide by international rules. For example, how can a company defend itself against chain email letters that unfairly damage the company's reputation and its products?

Pornography is another area that is difficult to control without trampling on free-speech rights.

Personal privacy is under a great threat because the Internet is, perhaps, the greatest method ever devised for collecting personal data. As more data become available, the greater the threat to personal privacy because it is going to become possible to identify people very precisely. So, it is not a question of "big brother" watching everyone, it's a matter of "big brother" watching individuals.

Finally piracy and property, while different, go hand in hand. Because intellectual property is where most of the value that is created in the ideas revolution, piracy represents a real threat. Theft of intellectual property is extremely easy through the Internet.

We must find ways of protecting intellectual property and at the same time we have to ask ourselves just how much do we want to protect it, Cairncross said. If we protect it too much we might do a lot of damage to society. For example, a new drug that is expensive might be so protected that whole societies cannot afford to purchase the drug to protect its citizens from disease.

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*How can we strike a balance between the right of a commercial company to profit from intellectual property and the rights of society at large to benefit from it?*  
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## Some winners

Cairncross identified several winners in as a result of the ideas revolution: 1) the distant, 2) the young, 3) the creative and skilled, 4) niche players, and 5) the United States.

The distant become winners because geographic remoteness is no longer a barrier to participation.

The young will be winners because young people are comfortable with communicating electronically – on the telephone, on television and with computers. Also, typically, the young are well educated and are eager to experiment. They are comfortable with the choices offered by the new technologies, and they are used to distance.

The creative and skilled benefit because the world we live in now rewards innovation, a premium is given to those who generate and implement new ideas first.

Niche players are those who have just one "trick" and they do it well. The ideas revolution will reward these niche players handsomely.

Above all, the United States becomes a winner because the U. S. leads the world in Internet use and ownership of personal computers – the vehicles of the ideas revolution. Also, the U. S. is home to big intellectual property industries. Other reasons for U. S. success are that English is the dominant language used, the people are generally comfortable with distance commerce (mail-order catalogues, etc.) and use of credit cards. Finally, there is an abundance of accessible venture capital in the United States.

# Application Points

The *Death of Distance* offers new perspectives about the future, for corporate America, for small business America, and for government. How can you prepare yourself for that future? You might begin by answering questions posed by Frances Cairncross' presentation.

**How can the work in my organization be affected by the ideas revolution? Where are areas I can lead my group to the benefits of the *Death of Distance*?**

**What are technologies that my company uses that lend themselves to profiting in the future? What intellectual property does my company have that can be exploited by new technology?**

**Where is my company vulnerable to new technologies?**

**How is my organization positioned to take advantage of the “three-shift, three-time-zone” future Cairncross foresees?**

**What business niches might be available to my organization that could ensure future success?**

**What brands do my company have (or need) to compete successfully in the global market, and how can I enhance that brand recognition?**

**What is the prospect that employees of my organization could become “e-lance” workers, and what are the implications to the company if that eventuality occurs?**

**If new relationships are formed between businesses and customers, how will that affect my organization and how will the people in my organization respond? What do I need to do to prepare my employees for these new relationships?**