

LIVING NETWORKS

ANNIVERSARY EDITION



LEADING YOUR
COMPANY, CUSTOMERS,
AND PARTNERS IN THE
HYPERCONNECTED ECONOMY

ROSS DAWSON

LIVING NETWORKS

Leading Your Company, Customers, and Partners
in the Hyper-Connected Economy

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What Business Leaders Say About *Living Networks*

"I'm not sure that even Ross Dawson realizes how radical—and how likely—his vision of the future is. Ideas that spread win, and organizations that spawn them will be in charge."

- **Seth Godin**, author, *Unleashing the Ideavirus*, the #1 selling e-book in history

"Dawson is exactly right—pervasive networking profoundly changes the business models and strategies required for success. *Living Networks* provides invaluable insights for decision makers wanting to prosper in an increasingly complex and demanding business environment."

- **Don Tapscott**, author, *Wikinomics*

"Ross Dawson argues persuasively that leading economies are driven by the flow of information and ideas. The ideas in his own book can position any individual or company at the center of that flow. It's a fast read, fun and full of examples."

- **Thomas H. Davenport**, Professor and Director of Research, Babson College, and author, *Competing on Analytics*

"*Living Networks* is a fast-paced tour of today's business frontier. Rich with examples drawn from a myriad of settings, every page forces the reader to ask "How can I use that?" Beware! This book will make you think!"

- **David Maister**, author, *Managing the Professional Service Firm*

"This is the most accessible introduction to the role of networks and networking I have yet seen. Ross Dawson speaks from his own experience in a language which will make it clear to managers what steps to take next. Networking with own staff, customers and professional peers is here to stay."

- **Napier Collyns**, co-founder, Global Business Network

"This is one of the most exciting books I've read in several years. Ross Dawson deftly examines the evolution of networks, organizations and strategy. He has more than succeeded in his intent, which is to produce a practical business book that shows business people how to leverage networks."

- **Melissie Rumizen**, author, *The Complete Idiot's Guide to Knowledge Management*

"The author has demonstrated that the success of his first book was no mere flash in the pan. His book is the one I would choose as a guide to understanding and action for the practical business person."

- **Bill Godfrey**, Editor, Change Management Monitor

About *Living Networks*: Anniversary Edition

Living Networks is being relaunched in its Anniversary Edition five years after its original publication by Financial Times/ Prentice Hall in November 2002, to revisit the foundations of our networked age.

Free chapter downloads of *Living Networks*:

www.livingnetworksbook.com

Ross Dawson's *Trends in the Living Networks* blog:

www.rossdawsonblog.com

About Ross Dawson

Ross Dawson is globally recognized as a leading authority on business strategy. He is CEO of international consulting firm Advanced Human Technologies, and Chairman of Future Exploration Network, a global strategy and events company. Ross is author of the Amazon.com bestseller *Developing Knowledge-Based Client Relationships*, and over 100 articles and white papers. Strong demand for Ross's expertise has seen him deliver keynote speeches on six continents and consult to leading organizations worldwide such as Ernst & Young, Microsoft, Macquarie Bank, Morgan Stanley, News Corporation, and Procter & Gamble. Ross's frequent media appearances include CNN, Bloomberg TV, SkyNews, ABC TV, Washington Post and many others.

Services to leverage the Living Networks

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Ross Dawson speaks at conferences and corporate meetings worldwide and works with senior executives as a strategy leader and facilitator.

www.rossdawson.com

Advanced Human Technologies

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Organizational network analysis

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Relationship leadership

Support in building high-value client, supplier, and partner relationships, including implementing key relationship management structures.

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Strategy consulting and scenario planning

Helping clients to develop clear, actionable strategies in highly uncertain environments, using a variety of future and strategy techniques.

Research

Deep research into technological, social, and business trends to support clients' strategic thinking and decisions.

CHAPTER 11

Future Networks



The Evolution of Business

The networks have only just come to life, placing you at the beginning of an extraordinary adventure. The remarkable pace of change leading to this point is likely to accelerate further, so you need to gain insights into a promising yet highly uncertain future. Ten predictions for the future of business in the networks are offered to help you act more effectively in the present.

Cast your mind back to the deep, distant past. If you can, think back as far as the late 1980s. Individual workers in companies were barely touched by communication technologies other than the telephone on their desks. All internal communication in companies was by inter-office memos, picked up and shuffled around by mailroom people sauntering by with their trolleys. Typing pools—rooms of women with bob-cuts (or bouffant hairdos, depending on your vintage)—were the interfaces between executives and typed documents. The only way to get information about a company and their products was to call them and get them to send a salesperson or catalog. At conferences, you had to wait in long queues for the payphones during breaks, and if you were late to meet someone you often had no way to let them know.

Just for a moment, consider quite how much the world has changed over the last dozen years. Much of what we take for granted today was almost inconceivable just that long ago. Humans are incredibly adaptable, and as our environment evolves over the years, it can be very hard for us to realize how much has changed. Many senior citizens who a few years ago were daunted by the technologies are now happily chatting on cell phones and exchanging e-mails or even videoconferencing with their children and grandchildren. The benefits of digital connectivity now seem totally natural to us.

Through this book you have examined how to succeed in business as you participate in the birth of the living networks. The time has come to cast your mind forward, to how the networks and the world of business will evolve. The extent of the change in the next dozen in years is likely to dwarf that of the past dozen years. The most successful businesspeople will be those who are sensitive and responsive to change, who are able to anticipate the future, and be highly adaptable in continually evolving their strategies as the landscape unfolds.

The future is unknown. The one thing we can be sure of is that we will be surprised. But thinking about the future is still useful. The heart of understanding the future is to distinguish clearly between what it is that you do know, and what it is that you don't know. From this platform you can create powerful, robust business strategies.

For example, we know as a certainty that technology will continue to progress. In some domains that progress is actually quite readily foreseeable. Telecommunications pundit George Gilder forecasts that the communications bandwidth available to consumers and business will triple every year. It may accelerate faster or slower than that, but we know for sure that it will grow extremely quickly.

On the other hand, we cannot know how social attitudes and consumer behaviors will shift, especially in response to unforeseen shocks or new choices. SMS text messaging was provided almost as an afterthought by European mobile service providers, and totally surprised them by spreading like wildfire with virtually no promotion. SMS now accounts for a large proportion of revenue for many European telecom firms, while downloading ringtones for cell phones is another unanticipated billion-dollar industry. We must also keep in mind that legislation is a key foundation for much of the business environment. Because this emerges from immensely complex interactions within the triangle of business, government, and individuals, its evolution is next to impossible to forecast.

Given this, and taking all we have learned through this book, I will venture 10 predictions on the future of business in the living networks. I believe these all have a high likelihood of being correct, and some are in fact very safe bets. However the primary intent of these predictions is to provoke you to think for yourself about what is likely to happen, and how to shift your business and career to be massively successful in our rapidly changing world. My 10 predictions for the future of business in the networks are shown in Table 11-1.

THE FUTURE OF BUSINESS IN THE NETWORKS

1. We will soon be immersed in connectivity
2. Transparency will drive business and society
3. Collaborative filtering will be the heart of the networks
4. Information filtering will be an evolutionary battlefield
5. Open, accepted standards will predominate
6. Almost all value creation will stem from collaborative relationships
7. Collaborative intellectual property models will flourish
8. Highly virtualized organizations will be a dominant force
9. The rapidly increasing pool of free agents will be polarized
10. People and networks will merge

Table 11-1: Predictions for the future of business in the networks

1. We will soon be immersed in connectivity

How long will it be before the majority of the population in developed countries has access to mobile, always-on broadband communication?

Given the right sort of hand-held or wearable devices, this will allow people to access all the resources of the Internet, do video phone calls with friends, access music and video clips, participate in graphic multi-player online games, and far more, all while you're on the move. We know as a certainty that we will have easy, pervasive access to high-speed connectivity. What is open to debate—and in fact vociferous argument—is how long it will take for that to happen.

Certainly the roll-out of the much-vaunted “3G” third generation mobile telephone networks has progressed far more slowly than its proponents expected. The headiest peak of the turn-of-millennium technology boom was perhaps when wireless providers jointly paid \$190 billion for the rights to 3G spectrum in Europe. That—combined with other telecom over-investment and slow demand—means that the sector must consolidate before it leaps forward again.

However, this pervasive access to connectivity could just as well emerge through entirely different means than the traditional telecom firms. Throughout America, people are setting up local wireless networks that allow anyone in the vicinity to tap into the Internet, using the 802.11b protocol (obviously not named by a brand consultancy!) that uses unlicensed radio spectrum. Many coffee shops, airport lounges, conference centers, and other venues are now using the technology to provide their visitors with high-speed Internet access. While many suppliers provide this access for a fee, there are an increasing number of enthusiasts that are intent on providing bandwidth for free.

The use of short-range wireless protocols can allow so-called “parasitic networks” to develop. In this system, wireless devices, rather than communicating with the nearest cell station, will transmit signals to the nearest wireless device, which in turn will pass the message on to others until it finds its destination. This can allow whole neighborhoods to be wired at minimal cost. Bill Wiecking has put together a free network that provides broadband coverage to over 300 square miles of Hawaii's Big Island.¹ Extending the principle, if enough people carry devices that use the same local wireless protocols, then in densely populated areas you will be able to make calls and send messages without paying a cent to your telecom provider.

We will soon reach a trigger point when demand for broadband—both from home and when roaming—will surge dramatically, probably primarily driven by access to entertainment. At that time a wealth of new applications, some of them based on providing people with the greater visibility described in the next section, will be launched to take advantage of the potential. Whether it is provided by telcos, community networks, or more likely a combination of these, sooner than many expect we will all live richly

immersed in connectivity. Only those who choose to isolate themselves temporarily from the networks or stray too far from populated areas will be unconnected. Discovering specifically how people want to use that connectivity will be an evolving adventure.

2. Transparency will drive business and society

Before I go to the beach I check out the surf-cam, to see what the waves are like. When I receive a foreign currency payment through my bank, I can find out the spot interbank exchange rate and see exactly how much profit they are making on the trade. Vault.com gives me an insider's view of the latest internal politics at my professional services and investment banking clients. I can look at the Greedy Associates feature on FindLaw.com to find out my lawyer's likely paycheck, based on the firm, location, and his or her seniority.

Information flows freely. Everything is becoming visible. Trying to stop information from getting out is like trying to keep water from running down to the ocean during a rainstorm. As a direct result of surging connectivity, transparency is rapidly growing in every domain of business and society.

New business models will emerge to exploit this increasing transparency. I want to know the traffic conditions on all my possible routes, and exactly where someone has just vacated a parking spot near my destination. UK firm Applied Generics is using data from the movement of thousands of mobile phones as they register with the local cell station to generate an accurate and up-to-the-second picture of traffic delays.² When I'm in the initial negotiation stages with a potential overseas partner, reports and perspectives from all the people they have dealt with will help me decide how to deal with them. There will be entire new industries in gathering, aggregating, and analyzing the vast universes of data that will be available. This will require new ways of working, and new pricing models for both raw data and the high-value outputs.

Transparency also impacts traditional businesses. If they want, companies can now usually get a very good idea of their suppliers' profitability. As a result, many suppliers today are going with the trend rather than fighting it. Several investment banks give their clients the pricing models they use for complex derivatives, so their profit margins are known exactly. Many large firms have built sophisticated client profitability models, and some of these choose to show the results to selected clients, to help develop a more mutually beneficial relationship. Contract electronics manufacturers like Flextronics, Solectron, and Celestica usually provide their clients with minute details on their costings. Clients will increasingly expect to know their suppliers' business in detail, and will strongly favor those who provide greater transparency.

David Brin evokes two worlds in his book *The Transparent Society*.³ In both, everything we do is visible. The difference between the two worlds is whether that transparency is one-way or two-way. We can take it for granted that government and big business will know almost everything about us. The question is whether individuals will be able look back, to make the institutions themselves visible and accountable. That will almost inevitably happen in time—the shift to transparency is unstoppable—however we all need to push hard so that it doesn't take longer than it should. In every aspect of our lives, transparency will be a reality, and we will need to change the way we think and act to make it an opportunity rather than a liability.

3. Collaborative filtering will be the heart of the networks

If you think we're living in a world of information overload, you ain't seen nothing yet. In addition to the established sources of information products, such as newspapers, newswires, publishers, and music labels, connectivity has opened the way for an entire universe of new sources and perspectives. Weblogs and independent media provide an immense amount of new, different, and often very high-quality reporting and analysis. Having expanded your choice in books from the 40,000 titles in your average bookstore to the 2 million or so available on Amazon.com, that figure is set to grow further as self-publishing becomes more common. MP3.com boasts 1.2 million tracks by 200,000 artists, and that's primarily non-mainstream material. In America alone, each and every day 360 hours of new television or film programming is created.⁴

Log onto MovieLens, and it will ask you for your personal ratings of a series of films. It then correlates this information with the opinions of its other members to provide you recommendations on what films you are likely to enjoy, and predictions of your ratings of any other film. This, together with some of the other instances we've looked at through the book, such as Slashdot.org, Open Ratings, and Media Unbound, illustrates how collaborative filtering is helping people to deal with the massive overload that is symptomatic of our times.

Formal collaborative systems such as these were first developed around 1995 by Pattie Maes and her colleagues at the MIT Media Labs. It is only now that the unbounded flow of immense amounts of information through the networks is bringing them into their own. In fact the entire structure of the Internet is already shifting to be based on collaborative filtering principles. As you saw in Chapter 1, the enormous success of Google is based on how it uses people's judgments to offer the best links, and weblogs inherently make visible the most useful and interesting information. In coming years, improved ways of tapping the power of collaborative filtering approaches will be at the heart of the networks. Those that implement them effectively will play a major role in bringing the networks to life, and will profit in the process.

4. Information filtering will be an evolutionary battlefield

Bats' use of echolocation to find their prey is one of the marvels of nature. Bats produce high-frequency sounds, and by picking up and distinguishing the immensely quieter echoes off insects in the air, can instantaneously calculate the location of their next meal. The evolution of this extraordinary capability has led to moths evolving in response. The soft outside of their wings and bodies absorbs the bats' ultrasound. Moths engage in evasive flying stunts when they hear bats squeaking. Some moths have even evolved the ability to produce ultrasound as well, possibly to startle and throw off bats. In turn, bats have developed complex flying behaviors to confuse moths, and occasionally turn off their echolocation to stop the moths jamming their signals.⁵

This is a case of what biologists call a "coevolutionary arms race". Each participant in a system evolves new capabilities and behaviors in response to others' development, in turn requiring them to evolve yet further in order to survive. There are many parallels in human society, not least the planet's very real arms races. One of the best examples in the years and decades ahead will be the coevolution of information dissemination and filtering, involving battles of words, legislation, and more than ever, technology.

AdSubtract is one of a wealth of programs available that remove advertisements from web pages. You can surf at will, and never see an ad. David Mann of the University of Toronto sees this kind of functionality going a lot further. He has designed spectacles that take into account your head and eye position, and replace anything you don't want to see with the images of your choice. His favorite example is a man standing at a urinal replacing a condom advertisement on the wall with a film of a soothing waterfall.⁶ You could just as well replace every billboard on your route home with pictures of your spouse and children.

Jamie Kellner, chairman and CEO of Turner Broadcasting, was quoted in early 2002 saying that skipping commercials when watching television programs is theft. Fortunately, he did allow that there was some scope for taking bathroom breaks.⁷ Phew. Several commentators recalled the scene from the book and film *A Clockwork Orange*, in which Alex has his eyelids forcibly held open as he is shown videos for his reeducation.⁸ Hopefully our legislators will stop before we get to that point.

We know as a certainty that we will be swamped as marketers endeavor to reach us with their messages everywhere we look, everywhere we go. Companies are going to ever-greater lengths to get through to their target audiences. In response, individuals are trying to escape, using devices that make call center systems think their telephones are disconnected, setting up e-mail spam filters, and returning junk mail. As communication becomes

increasingly digital, the nature of this will change. Agent technology, which we discussed in Chapter 4, will increasingly be charged with selecting and presenting to us only what we want to see from the onslaught of information. Indeed, this is the domain of some of the most promising—and useful—current developments in artificial intelligence. In response, marketers will develop technologies to attempt to fool and bypass those filters.

The battle is engaged. As people find ways of filtering advertisements and messages effectively, marketers will find ways around them, leading to yet further advances. Technologies will be pitted against other technologies in a coevolutionary dance. At some stage, we will become onlookers as our agents engage in information warfare on our behalf.

5. Open, accepted standards will predominate

Without open, accepted standards, the Internet would not exist. We would be struggling to communicate between different domains of technology. Indeed, we often still are. As you saw in Chapter 2, there are strong vested interests in developing and holding on to proprietary networks. Microsoft is not likely to open up Windows to its competitors any time soon. However, as discussed in Chapter 5, its Office suite of software is competing with OpenOffice, which uses the same file formats.

The forecast that open, accepted standards will dominate is perhaps the most contentious in this list. The powerful interests of some of the world's largest firms will at times be pitched to keep open standards from being adopted. It is possible that as new technologies succeed old ones, large companies or alliances will be able to establish and effectively own new standards. Standards bodies are notoriously slow and unwieldy beasts, and can often lag real-world technology developments in their work.

Despite these challenges, over time it will become increasingly difficult to set standards that are not open. Customers will not tolerate them, and companies that attempt to establish proprietary positions will find all their competitors very happy to collaborate in order to break entrenched market positions. Many of the top players in their industries, such as IBM and Nokia, have recently become powerful advocates of open standards. In addition, the enforcement of anti-trust legislation in the US and Europe has arguably never been more stringent than it has been over the last decade. The result will be that significant portions of many industries—and certainly the flows of information within industries—will be based on jointly agreed and controlled standards.

Even given this powerful trend, there will still be profitable business opportunities based on trying to lock-in customers over the medium-term. There are degrees of openness, and many companies will pretend to be

fully open but weave in various proprietary approaches. However the only truly sustainable business models will be based on open standards, and those that make that push early will be the best poised to profit from the evolving landscape.

6. Almost all value creation will stem from collaborative relationships

The pace of commoditization is accelerating. In a connected world, any new and better offerings can be easily copied by competitors, sometimes almost literally overnight. It is becoming ever-easier for competitors to replicate your offerings, and then steal your customers by undercutting your prices. In addition, the shift to open, accepted standards dramatically levels the competitive field, and makes it far easier for customers to switch to new suppliers.

Virtually everything that will enable companies to escape the powerful gravitational force of commoditization is based on collaborative relationships. Those companies that can create value with their customers rather than for them, will have relationships that are both far more valuable to their customers, and immensely difficult for others to reproduce. They will lock-in their customers simply by how much value they can create, while others will struggle as they reluctantly discover they are nothing more than commoditized vendors. The practice of collaborative customer relationships is illustrated by many of the examples given in Chapters 3, 4, and 6, such as Convergys' integration into its customers' operations, FMC Corporation's technology alignment with customers, and how Lucas Arts gets its customers to help develop its games.

In addition to customer relationships, the other key factor that will continue to provide differentiation is excellence at innovation. If you can consistently create new and better products, services, processes, and business models, you can exploit the market space before competitors copy you, even though that time advantage is ever-more fleeting. In addition, intellectual property gives legal protection to innovative ideas, and can often generate licensing revenue. As in the case of customer relationships, innovation is increasingly a collaborative endeavor. As you saw in Chapter 5, in order to innovate in a world of accelerating technological development, you must create the conditions and structures for effective collaboration both inside and outside the firm.

The most successful companies—those that achieve a better than marginal return on their investment—will be the ones that are outstanding at collaborative relationships with their customers and partners. This requires implementing enabling technologies, but far more importantly organizations must shift to cultures and behaviors that support this new business mentality.

7. Collaborative intellectual property models will flourish

We are at the beginning of a new phase in intellectual property, based on collaborative models for working and sharing value. The emergence of open source software as a serious market participant has paved the way for this shift, and the lessons learned are proving invaluable as a foundation for a new generation of business models. Some models will not be primarily commercial, for example the more liberal approaches to open source, but as you saw in Chapter 5, it is possible for similar principles to be applied to profit-making businesses. These approaches range from providing customers with products that are under development, as implemented by IBM alphaWorks, to the patent pooling approaches used to license MPEG-4 and Firewire.

The key driver for these new models to proliferate is that they allow companies to be better at creating valuable intellectual property, which is increasingly where the most value lies. Traditional approaches to intellectual property are rigid. This can severely limit innovation in an economy based on the swift flow and interaction of ideas. Those that can be more flexible in developing intellectual property will do better. It's that simple.

Many of the initiatives and approaches described in Chapter 5, notably Creative Commons, provide examples of the new approaches and initiatives that are charting the domain of collaborative intellectual property models. There is much further exploration and experimentation to be done. Some models will do well, others will founder. What we can be sure of is that new, collaborative business models for intellectual property and innovation will flourish. Companies and innovators will have far more choices in how they create new value with others, and extract their fair share of that value.

8. Highly virtualized organizations will be a dominant force

In 1992, the year the web browser was invented, Davidow and Malone published *The Virtual Corporation*.⁹ The book put the topic squarely on the management agenda, however the reality was that the technologies were not yet available to implement the vision, and the concept was still treated primarily as an internal management issue. Since then the idea has become a reality, with companies like Visa, Cisco, Dreamworks SKG, and many of the companies mentioned in this book leveraging connectivity to create virtual organizations within a broad web of alliances.

It is only now, however, that the emerging technologies described in Chapter 2 and through this book are allowing an almost unlimited degree of choice over what is done inside and outside the company—if indeed those boundaries still have any meaning. We know that the economy will not be reduced to a set of individuals interacting. The need for significant capital in many industries, the realities of economies of scale, the value of a consistent workforce, and many people's desire for a highly social work

environment and the stability of employment contracts mean that large companies will endure. Many of these will not be true virtual organizations, in the sense of having no solid core, but most will have virtualized many aspects of their operations. They will use technology to implement to varying degrees the modular organization described in Chapter 9.

Many companies will on the surface look similar to contemporary firms, but their underlying processes will be distributed across many customers, suppliers, and partners. An increasing number will be more obviously virtual, with a small nucleus responsible for massive yet far-flung value-creation.

The simple fact is that those firms that do not take full advantage of the possibilities of reshaping their boundaries will not be competitive. Managers who insist on maintaining monolithic organizations will see their companies left behind. One particular instance of virtual organizations, professional networks, will become a significant force in the economy. It is only recently that groups of independent professionals working collaboratively have the tools to compete with large firms. As you saw in Chapter 9, new models for professional networks are now being explored. The most effective of these networks will form a vibrant new sector of the economy that many traditional firms will have to treat as a major competitive threat.

9. The rapidly increasing pool of free agents will be polarized

In truth, we are all free agents, working for ourselves. Sometimes we choose to indenture ourselves to a company to gain access to resources and a more regular income. However, increasingly, people are working independently. For many, it is a choice—they gain flexibility, often earn more, and very importantly, don't have to deal with office politics and deadbeat bosses! Others are pushed, making the transition to life as a free agent in the wake of being made redundant. Over time, the boundaries between employment, contracting, and running a successful micro-business will blur, for these to look increasingly similar.

In the global connected economy, it is not just companies that are subject to the powerful forces of commoditization. Individuals too are finding new competitors springing up on all sides, offering the same services at lower prices. As you saw in Chapter 10, unless you clearly differentiate yourself, you will have to sell your services on the basis of price. For free agents, connectivity can be both a blessing and a curse. Some will benefit enormously by being able to tap into global markets, and collaborate with the best in the world. Others will find that there is relentless downwards pressure on the fees they can charge. The result will be a polarization of knowledge workers, with on the one hand many reaping massive rewards, and on the other many more who struggle to do well.

The differences between the workers at each end of this spectrum will be those we discovered in Chapter 10. A precisely chosen specialization, the inclination and skills to collaborate with others, and a diverse network of trusting relationships will be the foundation to spectacular rewards. This polarization of workers could have significant social impact, both within nations, and across the globe. We need to ensure not only the broadest possible access to connectivity, but also that people have the skills and attitudes to work effectively in a networked world.

10. People and networks will merge

In the 1957 film *The Invisible Boy*, a supercomputer plots to take over the world and destroy all organic life—an early contribution to what is now a long tradition in the theme. Since computers were conceived, mankind has feared being enslaved by machines with superior intelligence. Despite the very disappointing progress in artificial intelligence over the last two decades, the trend is clear: computers are getting smarter. The debate rages over whether computers will ever become more intelligent than people, with esteemed scientists ranged against each other. No one argues over the inevitable continuing improvement of computers' capabilities. Ray Kurzweil estimates that computers will exceed the ability of the human mind sometime between 2020 and 2050. Others suggest that there is something ineffable about the human mind that can never be replicated by a machine.

However the real issue is not whether humans will be replaced by machines, because at the same time as computing technology is progressing, people are merging with machines. If machines take over the world, we will be those machines. As you saw in Chapter 2, the interfaces between systems and people are still very limited, primarily based on clunky technology like keyboards, but things are swiftly changing.

Scientists at Duke University in Durham, NC, implanted electrodes in a monkey's brain, and were able to program a robot arm to replicate and even anticipate its movements as the monkey reached for food. They then hooked the signals up to the Internet so that the monkey's thoughts controlled a robot arm at MIT in Boston, almost 1000 kilometers away.¹⁰ In a similar experiment, monkeys were able to control the movement of a cursor on a computer screen, earning orange juice as a reward.¹¹

Others are working on ways to integrate computers into our brains. It will certainly be useful if I can get a massive database plugged directly into my brain—no more forgetting people's names! But it doesn't need to go that far. David Mann envisions that his intelligent spectacles will use face recognition software to attach nametags only we can see to the people we encounter.

The key issue is that as the interfaces between people and digital technology improve, people can be better connected. We can share our experiences, our ideas, and our thoughts with whoever we choose. The micro-messages that are currently conveyed by brief text messages will be as broad in scope as we wish. The boundaries between the individual and the networks will have dissolved.

Connected to the future

Whatever the future holds for business and humanity, there is one thing we know for sure. The networks that link us, that make us one, will be at the heart of our destiny. We are living at a critical juncture in the history of our species. While we will all continue as individuals, in control of our own destinies, at the same time we are participating in the birth of a higher-order lifeform. Just as a living human brain is ultimately a set of neural impulses, the living networks consist of the flow of information and ideas. Together, human minds and technology form the substrate for that flow.

The implications of the networks' birth encompass every aspect of society, politics, and business. This book has examined how business is changing, focusing on the present, and what actions businesspeople need to take today in order to be successful in this emerging world. Business is in fact central to the vast majority of these flows. Those who are actively engaged in the issues covered in this book will play a fundamental role in how the networks develop, impacting our entire future as a society. As you finish reading this book, consider your personal role in our shared evolution. It is an important one. You have the choice of leadership, of helping to bring the living networks to reality, and in the process achieving success for yourself and those around you. Please grasp that opportunity fully—your energy and vision will help to accelerate us into the most exciting time in human history.

Thank you for accompanying me on this journey into the living networks. I wish you every success as you participate in the growth and evolution of this exhilarating new world.