# DOES IT MATTER?

## INFORMATION TECHNOLOGY

### AND THE CORROSION OF COMPETITIVE ADVANTAGE

NICHOLAS G. CARR

## Voices from the "great debate" over "IT Doesn't Matter"

In May 2003, *Harvard Business Review* published an article entitled "IT Doesn't Matter" by one of its former editors, Nicholas G. Carr. It provoked a swift and powerful response, triggering a heated debate over the role of IT in business that has only increased in scope and intensity. Here's some of what people are saying:

". . . a bombshell of an article . . ." ***–Forbes***

". . . dangerously wrong . . ." ***–Fortune***

". . . accurately describ[es] the technology world in the post-bubble era . . ." ***–CNN/Money***

"Hogwash!" **–Steve Ballmer,** CEO, Microsoft

". . . important, perhaps even seminal . . ." **–John Seely Brown,** former Chief Scientist, Xerox Corporation

". . . dead wrong . . ." **–Carly Fiorina,** CEO, Hewlett-Packard

"Carr . . . [has] performed a service in puncturing some of the starry-eyed and self-serving cant of industry insiders." ***–Newsweek***

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"Companies around the world have spent billions of dollars on information technology, yet in most cases the investment has failed to produce any genuine competitive advantage. In his timely and provocative book, Nicholas G. Carr explains why this is so, and challenges business leaders to take a more prudent and practical view of the role of IT in business success."

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"This is an important and insightful book which will have a significant impact on how corporations think about IT and its role in business strategy. A must-read for both CIOs and CEOs."

**–Tony Comper,**
CEO of BMO Financial Group

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CARR DOES IT MATTER?

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# DOES IT MATTER?

## INFORMATION TECHNOLOGY AND THE CORROSION OF COMPETITIVE ADVANTAGE

NICHOLAS G. CARR

$26.95

"Carr forces us to reexamine some of our most basic assumptions about IT and business value. You may not agree with his perspective, but that is almost beside the point. He challenges all of us to be clearer about where the value of IT resides. Critical business choices and actions hinge on the outcome of this debate."

**–John Hagel,** management consultant and author, *Out of the Box*

### THE END OF IT AS WE KNOW IT

Every year, companies spend more than $2 trillion on computer and communications equipment and services. Underlying these enormous expenditures is one of modern business's most deeply held assumptions: that information technology is increasingly critical to competitive advantage and strategic success.

In this explosive and engaging book, Nicholas G. Carr calls the common wisdom into question, contending that IT's strategic importance has actually *dissipated* as its core functions have become available and affordable to all. Expanding on the controversial *Harvard Business Review* article that provoked a storm of debate around the world, *Does IT Matter?* shows that IT—like earlier infrastructural technologies such as railroads and electric power—is steadily evolving from a profit-boosting proprietary resource to a simple cost of doing business.

Carr draws on convincing historical and contemporary examples to explain why innovations in hardware, software, and networking are rapidly replicated by competitors, neutralizing their strategic power to set one business apart from the pack. But more important, he shows why IT's emergence as a shared and standardized infrastructure is a natural and necessary process that may ultimately deliver huge economic and social benefits.

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(Continued from front flap)

At the same time, the new IT infrastructure presents a host of challenges for businesses. Carr lays out a new agenda for IT management that stresses cost control and risk management over innovation and investment, and offers guidelines executives can follow to reevaluate everything from spending and staffing to security and outsourcing. He also examines IT's broader strategic implications, highlighting hazards that could ensnare unwary managers.

The way that executives respond to IT's changing role will influence their companies'—and their own—fortunes for years to come. An eloquent and long-overdue assessment of one of the most important business phenomena of our time, *Does IT Matter?* is a must-read for business and technology managers, investors and policy makers, and anyone with a stake in IT's future.

PHOTO BY IAN CHURCHILL

An acclaimed business writer and thinker, **Nicholas G. Carr** is a former Executive Editor of the *Harvard Business Review.*

For more information about the book, please visit

**www.nicholasgcarr.com/doesitmatter.html**

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# Preface

## The Great Debate

MORE THAN FIFTY YEARS have passed since computers began to be used in business, yet there remains much we don't know about their influence on commerce in general and corporate performance in particular. At a broad level, we can't yet say precisely why computerization had little effect on industrial productivity for four decades and then, in the mid-1990s, suddenly seemed to become the driving force behind a sharp acceleration in U.S. productivity. Nor can we say with certainty why the recent productivity gains have been so unevenly distributed, appearing in certain industries and regions that have invested heavily in information technology but not in others that have also spent great sums on computer hardware and software.

When we look at individual companies, the picture becomes even murkier. Information technology has changed

is shared by all competitors. Information technology has increasingly become, in other words, a simple factor of production—a commodity input that is necessary for competitiveness but insufficient for advantage.

The emergence of a ubiquitous, shared IT infrastructure has, as I will show, many important practical implications, both for how companies manage and invest in technology itself and, more broadly, for how they think about creating and defending competitive advantages. The way executives respond to IT's changing role will influence their companies' fortunes for years to come.

## Background and Scope

This book deepens, expands, and extends a point of view that I originally presented in an article in the May 2003 edition of the *Harvard Business Review*. That article, entitled "IT Doesn't Matter," has become a touchstone for a wide and often passionate debate among the suppliers and users of information technology. In dozens of articles published in newspapers, business magazines, and IT journals around the world, my thesis has been discussed and dissected, questioned and critiqued, attacked and defended. Many respected executives, business professors, and journalists have probed the strengths and weaknesses of my argument and offered their own views on IT and its meaning for business. Beyond the intellectual and practical value of the discussion, which is considerable, its very breadth and intensity underscore both the importance of this subject for companies and the profound lack of a common understanding of it.

true, and it will continue to be so. Indeed, as the strategic value of the technology fades, the skill with which it is used on a day-to-day basis may well become even more important to a company's success.

Nevertheless, the development of a common and universal IT infrastructure does influence and in some cases constrain the way the underlying technology and the information it carries are used. As I hope to show in the pages that follow, one of the greatest challenges facing today's managers is understanding how the new infrastructure reshapes many operational and strategic decisions. Even commodity inputs can't be taken for granted.

It is also important to make clear that I am talking about the technologies used for managing information inside and between companies in what has come to be called the developed world. I am not talking about the use of IT in the home or its incorporation into consumer products, both of which seem to me areas ripe for rapid innovation as the vast computer, media, and consumer electronics industries converge.[2] And I am not talking about its use in emerging markets, which in general have much less advanced IT infrastructures. The sellers and users of IT in emerging markets can learn a great deal from the experiences of their counterparts in the developed world, as I hope this book will make clear, but they are in different positions and face different challenges.

## The Plan of the Book

I open with a brief introductory chapter, "Technological Transformations," that provides an overview of my thesis and

underscores the value of examining IT from a strategic perspective. I stress in this chapter what I see as the central—and positive—message of this book: that IT's transformation from a set of proprietary and heterogeneous systems into a shared and standardized infrastructure is a natural, necessary, and healthy process. It is only by becoming an infrastructure—a common resource—that IT can deliver its greatest economic and social benefits.

The second chapter, "Laying Tracks," introduces and explains the critical distinction between proprietary and infrastructural technologies. I describe how the business use of past infrastructural technologies, from railroads to electric power, evolved in a predictable way that foreshadowed what we've seen with IT. In particular, the pioneers of an infrastructural technology often gain lasting advantages in the early stages of its development, but as the infrastructure matures and becomes cheaper, more accessible, and better understood, competitors are able to rapidly copy any valuable new innovation.

In Chapter 3, "An Almost Perfect Commodity," I examine the technical, economic, and competitive characteristics of IT that lend it to particularly rapid commoditization. I address in this chapter two of the most significant criticisms of my argument: first, that I overlook the almost unlimited potential for innovation in software and, second, that I ignore the continuing changes in the way IT assets are organized—in the IT "architecture," as technologists put it. While granting that computer software is more malleable and adaptable than earlier infrastructural technologies, qualities that make it less susceptible to commoditization, I will argue that it exhibits



other qualities that push it in the other direction—toward commoditization. And while acknowledging the continued evolution of the IT architecture, I will suggest that at this point most innovations will tend to enhance the reliability and efficiency of the shared infrastructure rather than enable proprietary uses of that infrastructure.

Chapter 4, "Vanishing Advantage," looks at the history of the use of IT by companies, showing how closely it follows the pattern established by earlier infrastructural technologies. Some critics of my thesis have argued that "IT never mattered" as a source of advantage. In this chapter I show, through case studies of several IT pioneers, that information systems and networks actually formed very durable barriers to competition in the past but that those barriers have fallen as IT has advanced. I also introduce the idea of the *technology replication cycle,* a concept crucial to gauging whether a strategic IT investment will ultimately pay off.

Chapter 5, "The Universal Strategy Solvent," steps back from the close examination of IT management to describe how the emergence of a new business infrastructure can change the basis of competition in markets. I discuss the corrosive effects of the IT infrastructure on some traditional forms of competitive advantage and describe how business success increasingly hinges on the simultaneous pursuit of both *sustainable* and *leverageable* advantages. I also explain how companies should take care in balancing the need to share information and processes with partners with the need to maintain their organizational integrity. The IT infrastructure makes specialization and outsourcing easier, but that doesn't mean companies should rush to pursue them.

In Chapter 6, "Managing the Money Pit," I turn to the practical managerial implications of the commoditization of IT. Stressing the importance of controlling cost and risk, I offer four guidelines for IT investment and management: spend less; follow, don't lead; innovate when risks are low; and focus more on vulnerabilities than opportunities. I also provide a number of examples of recent company practices that provide models for action. My intent here is not to provide an IT textbook—others are better qualified than I for that job—but rather to offer a new managerial perspective that will help both business and technology managers make appropriate decisions in the years ahead.

The final chapter, "A Dream of Wonderful Machines," explores the broader consequences of information technology for economies and societies. I describe how our natural enthusiasm for a new technology, with its promise of renewal, can lead us to exaggerate its benefits and overlook its costs, and I examine how this bias has influenced our perceptions of the so-called computer revolution.

Such a discussion is particularly timely today. We are arriving at a turning point in the history of IT in business with the convergence of three important trends that will shape the future. First, companies are reevaluating their approaches to IT investment and management as the economy emerges from the post-Internet-bubble downturn. Second, the technology industry is in the midst of a restructuring, as vendors reshape their competitive strategies in response to shifts in the marketplace. Third, policy makers and economists are assessing the broad impact of computers on industrial performance and



productivity, which will lead to crucial government decisions about the development of the IT infrastructure throughout the world. Making the right choices in all these areas requires an open exchange of information and views, and it is in that spirit that I offer this book.

## Acknowledgments

Several people helped me in arranging my thoughts and words. At the *Harvard Business Review,* my former colleagues David Champion, Andy O'Connell, Anand Raman, and Tom Stewart provided particularly valuable editorial suggestions while I was writing the article that would grow into this book. Jeff Kehoe, my editor at the Harvard Business School Press, helped focus my mind and my argument. Jeff also arranged for five anonymous reviewers, all experts in the IT field, to critique a draft of the book, and their incisive comments led to refinements in logic and prose throughout. Many other writers on business and technology influenced my thinking and helped shape my argument; I document those influences in the notes and bibliography at the end of the book. Finally, I want to thank the staff at the Gleason Public Library, who handled an oppressive number of interlibrary loan requests with unwavering good cheer.

CHAPTER I

# Technological Transformations

## *The Rise of a New Business Infrastructure*

IN 1969, a young electrical engineer named Ted Hoff had a particularly elegant idea. Hoff had recently joined the Intel Corporation, a fledgling semiconductor company in Santa Clara, California, and had been assigned to a project to produce a set of twelve microchips for a new calculator being developed by the Japanese electronics company Busicom. Each chip would be dedicated to a different function: One would perform the calculations, one would control the keypad, one would display images on the screen, one would handle the printing, and so on. It was a tricky assignment—some

CHAPTER 2

# Laying Tracks

## *The Nature and Evolution of Infrastructural Technologies*

MODERN BUSINESS WAS BORN, it might be argued, in the fall of 1829 in the small English village of Rainhill. Situated ten miles east of Liverpool, Rainhill lay directly in the path of the Liverpool and Manchester railroad, a major new line that had been under construction since 1826 and was expected to be completed by the end of 1830. The cost of laying the thirty-two miles of track would come to exceed a half million pounds sterling, making it at the time the most expensive railroad ever built. The owners of the line, eager to recoup their vast investment, were desperate to enhance rail transport's attractiveness by increasing its speed. At the time, trains rarely

CHAPTER 3

# An Almost Perfect Commodity

## *The Fate of Computer Hardware and Software*

IS INFORMATION TECHNOLOGY an infrastructural technology? Is its potential for providing competitive advantage fading as it becomes more powerful, more affordable, and more standardized and as its implications for business practice and industry structure become more evident and better understood? Is it, in short, fated to become a commodity input like rail transport, telephone service, and electricity?[1]

Such questions are critically important to business managers, but they're not easy to answer. Information technology

CHAPTER 4

# Vanishing Advantage

## *Information Technology's Changing Role in Business*

IN THE MID-1990S, at the dawn of the great Internet gold rush, two academic studies appeared that examined the connection between information technology and competitive advantage. The first, published in *MIS Quarterly* in 1996, was by Erik Brynjolfsson and Lorin Hitt of the Massachusetts Institute of Technology.[1] Brynjolfsson and Hitt had earlier conducted a groundbreaking study of the impact of information technology investments on business productivity, which concluded that computer systems did, at least eventually, lead to gains in productivity.[2] They then decided to see what happened to those productivity gains: Were companies able to

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CHAPTER 5

# The Universal Strategy Solvent

## *The IT Infrastructure's Corrosive Effect on Traditional Advantages*

ALTHOUGH INFRASTRUCTURAL technologies lose much of their power to provide competitive advantage as they mature, they don't lose their power to destroy it. The rail system, for example, neutralized many of the traditional locational advantages held by companies situated near ports, mineheads, and population centers. The telegraph reduced the value of long-cultivated international business relationships built on written correspondence and confidential couriers. The establishment of the electric grid rendered obsolete old ways of manufacturing and the advantages that went with

CHAPTER 6

# Managing the Money Pit

## *New Imperatives for IT Investment and Management*

IN THE SUMMER of 1997, the U.S. railroad system broke down. As the recently merged Union Pacific and Southern Pacific struggled vainly to combine their operations, their vast rail network became gridlocked, and thousands of cargo shipments were delayed, misrouted, or lost. On October 31, the federal government stepped in, declaring a transportation emergency throughout much of the country. Particularly hard hit were industrial and agricultural companies in Texas, many of which were served solely by Union Pacific lines. By early 1998, for example, the U.S. arm of the large Mexican cement producer Cemex had seen outbound rail service at its Texas plants cut by 50 percent, and the company was losing hundreds of

CHAPTER 7

# A Dream of Wonderful Machines

## *The Reading, and Misreading, of Technological Change*

J. LYONS & COMPANY'S decision to build the first business computer back in 1947 stands as one of the great acts of business innovation, a triumph of managerial foresight and ingenuity. And the decision paid off for the company, enabling it to automate labor-intensive business processes years ahead of its competitors. But for all its power and speed, the LEO computer could not save Lyons from obsolescence. The company's teashops, a staple of English life before the Second World War, slowly fell out of favor after the war as customers' tastes and routines shifted. The computer brought Lyons great