

The Next Wave of Technologies

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Opportunities from Chaos

PHIL SIMON



WILEY

John Wiley & Sons, Inc.

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Published by John Wiley & Sons, Inc., Hoboken, New Jersey.

Published simultaneously in Canada.

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Library of Congress Cataloging-in-Publication Data:

Simon, Phil.

The next wave of technologies : opportunities from chaos / Phil Simon.

p. cm.

Includes bibliographical references and index.

ISBN 978-0-470-58750-8 (cloth)

1. Information technology Management. 2. Technological innovation Management.

3. Computer systems Management. 4. Cloud computing. I. Title.

HD30.2.S577 2010

004.068 dc22

2009046294

Printed in the United States of America

10 9 8 7 6 5 4 3 2 1

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PART I

Introduction, Background, and Definitions



The Changing Landscapes of Business and Technology

Phil Simon

Ex chaos facultas.

Latin, “From chaos comes opportunity.”

Introduction

The worlds of technology and business are colliding faster and more intensely than ever. Organizations today are facing increasing pressures with respect to innovation, operational excellence, and financial performance while concurrently keeping costs at an absolute minimum. Relatively recent technologies provide enormous possibilities for organizations to confront everyday and long-term business challenges. The need for organizations to understand how to use these new technologies—and then actually utilize them effectively—has never been greater.

At best, organizations slow to embrace these opportunities often cost themselves money, via reduced revenue, profits, and market share or via higher expenses. First-mover advantage has arguably never been more pronounced, as organizations such as Google, Twitter, and Facebook can go from anonymous to ubiquitous almost overnight. At worst, technological laggards may no longer be around to eventually get with the program. Along these lines, Jim Collins’s latest book, *How the Mighty Fall: And Why Some Companies Never Give In*, addresses the five stages of organizational decline. This prompts the question: What, if anything, can information technology (IT) do to stop an organization’s demise? (Chapter 3 addresses this topic.)

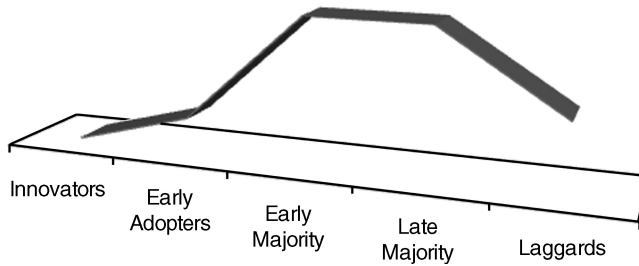


FIGURE 1.1 The Technology Adoption Life Cycle (TALC)

Of course, not every organization embraces new technologies as quickly as others. This concept is known as the Technology Adoption Life Cycle (TALC).¹ TALC is used to describe the adoption of new technologies, typically including the stages of innovators, early adopters, early majority, late majority, and technology laggards. In a nutshell, very few organizations implement new technologies right after their introduction; graphically represented in Figure 1.1.

In his well-researched book *Does IT Matter?: Information Technology and the Corrosion of Competitive Advantage*, Nicholas Carr makes the case that most organizations should learn from the competition; they should wait for other organizations to make IT-related mistakes. He deftly points out examples such as United Parcel Service (UPS) successfully adopting a “follow, don’t lead” IT approach. Carr writes that “UPS was often attacked through the 1980s and 1990s for being a technological slowpoke. All the while, though, UPS was carefully following in FedEx’s tracks, learning not just how to copy its rival’s systems but often how to make them better and cheaper. When UPS rolled out its own logistics-management software, for instance, it went with a more open system than FedEx’s, making it easier for customers to incorporate UPS’s technology into their existing systems.”

A thorough discussion on how, why, and when organizations should implement technologies is not warranted here. For now, suffice it to say that the vast majority of organizations echoes Carr’s sentiment; they wait until a new technology has become pervasive and mature before deciding to use it, if at all. In other words, very few tend to be “on the left side of the curve.”

Enterprise 2.0: What’s in a Name, Anyway?

Some of the topics in this book have been collectively dubbed “Enterprise 2.0,” a term originally coined by Harvard Business School associate

¹See <http://dictionary.bnet.com/definition/technology+adoption+life+cycle.html>.

professor Andrew McAfee in a 2006 *Sloan Management Review* article. McAfee defined Enterprise 2.0 as “the use of emergent social software platforms within organizations, or between organizations and their partners or customers.”

Along those lines, in a 2008 report for the Association for Information and Image Management (AIIM), Carl Frappaolo and Dan Keldsen defined Enterprise 2.0 as “a system of web-based technologies that provide rapid and agile collaboration, information sharing, emergence and integration capabilities in the extended enterprise.”

This book intentionally uses the term *Enterprise 2.0* more broadly than those definitions. I admit that it is quite difficult to succinctly distill all of the aspects of the next wave of technologies into a few sentences. Because of this, perhaps Enterprise 2.0 is best defined in the negative against “Enterprise 1.0.”

Now, I’m no revisionist. I know that the term *Enterprise 1.0* never formally existed back in the 1990s and early 2000s. I was there. With the benefit of hindsight, however, what I’m calling Enterprise 1.0 ultimately represented organizations’ initial efforts to democratize computing in the workplace. They replaced their clunky mainframes and ugly boxes previously confined to hard-core programmers with more user-friendly personal computers (PCs) that the everyday employee could use. Enterprise systems replaced paper-driven and manual processes. The PC became part and parcel of almost every corporate white-collar job as organizations moved from memos to emails. Examples of 1.0 technologies included Enterprise Resource Planning (ERP) systems, relational databases such as Oracle and SQL Server, client-server applications, email (arguably the era’s killer app), and corporate web sites and intranets.

In short, Enterprise 1.0 represented the first technological wave that allowed organizations to do the following:

- Increase the level of enterprise integration.
- Allow employees to access information away from traditional mainframes.
- Begin to knock down organizations’ information silos.
- Embrace email and the Internet.
- Dabble with different communication and collaboration tools.

Conversely, Enterprise 2.0 represents the next wave of technologies. In this book, I define Enterprise 2.0 as organizations’ efforts to deploy and utilize emerging technologies, systems, applications, platforms, social media, and software development methodologies. Examples of these technologies include: cloud computing, social networking, business intelligence (BI), software as a service (SaaS), enterprise search and retrieval (ESR), and open source (OS) applications.

In other words, for the purposes of this book, Enterprise 2.0 means going beyond the basics. It assumes that organizations can already accurately run financial reports, pay employees, communicate with customers and employees, track inventory, and the like. (At a high level, this was the entire point of Enterprise 1.0.) Note, however, that there is almost always room for improvement, as many organizations may not be performing these activities in an optimal manner.

Enterprise 2.0 consists of three general and intertwined principles:

1. Managing systems and data in a better, more integrated fashion.
2. Interpreting data to allow for higher-level analytics.
3. Enhancing communication among organizations, vendors, suppliers, employees, and customers.

Enterprise 2.0 versus Web 2.0

Enterprise 2.0 should not be confused with Web 2.0. The latter presently consists largely of social networking sites such as Twitter and Facebook, wikis, and mashups that people use for entertainment or personal reasons. Families, friends, and strangers can communicate online and share information outside of organizational walls.

For their part, Enterprise 2.0 technologies exist *inside* organizations—though this is a far cry from being closed off from the rest of the world. The primary objective of Enterprise 2.0 technologies is *not* to connect family, friends, or strangers. Rather, these technologies aim to improve productivity and enhance communication and collaboration among vendors, suppliers, customers, and employees. As such, emerging technologies need to provide greater security than Web 2.0 technologies. What's more, they should enforce business rules, provide for audit capability, and improve end users' access to key organizational information.

Caveats

I use the term *Enterprise 2.0* a bit sheepishly and with two caveats. First, I am very aware that the term smacks of consultant-speak. I am not a fan of jargon and favor a constitutional amendment outlawing the abuse of words such as “synergy” and phrases like “thinking outside the box.” However, it's simply easier for this book to refer to these concepts by one umbrella term.

Second, I am very well aware that many of these emergent technologies are in reality hardly new. Examples include SaaS, BI, and ESR. Think of them as children. While many may not have been born recently, they are only now hitting puberty. In other words, as of mid-2009, most organizations had yet to implement most of these technologies—much less utilize them

effectively. This is certainly not to imply that every organization needs to use every technology. In some cases, individual systems or applications may not make sense for different companies or industries. Still, foolish is the organization that believes that social networking or BI would offer no benefits.

Displacing the Displacers

Technology giveth and technology taketh away, a concept for which Joseph Schumpeter aptly coined the term *creative destruction* in his 1942 book *Capitalism, Socialism, and Democracy*. The term has had enormous staying power. How many economics texts are referenced almost 70 years after their publication date?

While Schumpeter wasn't writing about Enterprise 1.0 or 2.0, his central thesis still holds a great deal of water: All organizations are at risk of displacement at the hands of technology.

Creative destruction seemed to be all the rage during the dot-com boom of the 1990s. While that era seems quaint today, the few remaining and successful dot-coms are facing increasing pressure from nimble and hungry start-ups.

Consider LinkedIn, the six-year-old social networking site geared toward professionals, which has been making significant inroads against traditional job boards. In a recent *BusinessWeek* article, Matthew Boyle writes that Monster.com CEO Sal Iannuzzi recently acknowledged as much, saying, "We are not done," hinting that acquisitions could be forthcoming. But even Monster's architects see the writing on the wall. Bill Warren, the founder of an early job board that morphed into Monster, is now executive director of the Direct Employers Association, a consortium of corporate employers. He's partnering with the owner of the ".jobs" domain and will launch job sites under that domain later this year. Says Warren: The days of the big, expensive job boards are over.²

It seems like that just yesterday, online job boards replaced newspapers' classified ads. To paraphrase Jim Collins, it doesn't take time for the mighty to fall.

Particularly interesting is LinkedIn's use of push technology. As it relates to job searches, push technology allows recruiters and hiring managers to receive the profiles of candidates without having to actively pull them via searches. For example, a recruiter (Roger) is trying to fill an IT manager position at his company. LinkedIn will find and send Roger the profiles of qualified candidates without his having to wade through the backgrounds of hundreds of potentially underqualified applicants. This saves Roger time

²See www.businessweek.com/magazine/content/09_27/b4138043180664.htm.

and makes the entire process less costly and cumbersome. While LinkedIn cannot guarantee a good hire, perhaps the company can use business intelligence tools to answer that very question.

The LinkedIn example underscores two main points:

1. Every technology is potentially ephemeral. Eventually something may very well replace LinkedIn and social networking sites.
2. No organization can rest on its laurels. New technologies can be used quickly to displace industry leaders.

Understanding the Caution

The potential of these new technologies is hardly unproven. OS software SaaS, cloud computing, social networking, service-oriented architecture (SOA), BI, and other exciting new technologies are enabling organizations to do amazing things *right now*. Beyond merely reducing costs, they are already doing the following:

- Reducing product development times.
- Allowing organizations to better understand their customers.
- Expediting innovation and new product development.
- Enhancing employee communications and productivity.

For more on how organizations have harnessed the power of Web 2.0 technologies in often-unexpected ways, see Don Tapscott's excellent book *Wikinomics*. My favorite anecdote is of Goldcorp essentially allowing nitizens to become virtual treasure hunters.

Nor are these technologies being deployed exclusively by nimble start-ups such as LinkedIn. Old-school corporations such as IBM and Wal-Mart are classic examples. The former got religion in the 1990s on collaboration and OS software. Indeed, it is hard to imagine IBM as a shell of its current self if then-CEO Lou Gerstner had not fundamentally changed the organization's thinking and culture.

The story of Wal-Mart's use of customer data is both well documented and simply astonishing. For years, Wal-Mart has used data mining technology to unearth remarkable customer insights. A *New York Times* article³ written one week before Hurricane Frances in 2004 summarizes one fascinating discovery with respect to expected weather and consumer purchasing behavior. Reporter Constance L. Hays writes that "experts mined the data and found that the stores would indeed need certain products—and not just the usual

³<http://www.nytimes.com/2004/11/14/business/yourmoney/14wal.html?pagewanted=1>

flashlights. We didn't know in the past that strawberry Pop-Tarts increase in sales, like seven times their normal sales rate, ahead of a hurricane, then-CIO Linda Dillman said in a recent interview. And the pre-hurricane top-selling item was beer."

IBM and Wal-Mart are merely two examples of organizations that are simply doing amazing things with Enterprise 2.0 technologies. As they say, however, the exception proves the rule.

So, let's return to the original question: What is stopping so many organizations from jumping into these largely uncharted waters with both feet? Four things spring to mind:

1. Financial considerations
2. IT project failure rates
3. Uncertainty over the future
4. The Software Establishment

Financial Considerations

The meltdown of the financial system—and the subsequent pronounced recession—is a significant but not exclusive factor in explaining many organizations' resistance to numerous new technologies. Organizations' IT budgets were expected to grow between zero and 2.3 percent in 2009, according to Peter Sondergaard, senior vice president of research at Gartner Research.⁴ This range is considerably below recent norms. Another study by research firm Computer Economics found that one-third of organizations cut their IT budgets for 2009.⁵

In an effort to reduce costs, many organizations have gone way beyond trimming the fat; some have cut down to the bone, shredding essential IT personnel, canceling current projects, and putting the kibosh on future ones. However, simple economics and budgetary realities alone do not tell the whole story. We have to dig deeper.

IT Project Failure Rates

The failure rate for IT projects is conservatively estimated to be 60 percent.⁶ Particularly in the ERP sphere, these systems and their technologies have been relatively well understood for at least the past decade. This is not to say that ERP is a completely static technology. However, the basic precepts

⁴See Larry Dignan's ZDNet blog at <http://blogs.zdnet.com/BTL/?p=10403>.

⁵www.computereconomics.com/article.cfm?id=1409.

⁶See http://advice.cio.com/remi/two_reasons_why_it_projects_continue_to_fail.

of paying employees, running financial reports, and tracking inventory have not fundamentally changed over the past ten years.

The political and financial costs of a failed IT endeavor are enough to deter many senior executives from improving their organizations' applications, systems, and architectures. New technologies such as enterprise search and retrieval (ESR) offer enormous promise. Until these new toys become mainstream and mature, many organizations will remain reluctant to adopt them—and may pass altogether.

Uncertainty over the Future

Aside from—and related to—fear of failure, many organizations and their decision makers simply do not know enough about these new technologies to implement them in an effective manner. New software, platforms, and services can do many powerful and transformative things. However, absent a clear business purpose, properly defined business requirements, sufficient resources, and the like, these technologies will likely not achieve their intended goals.

What's more, many senior executives are not familiar with new technologies. As a result, they are justifiably risk-averse about adopting them. For example, consider a chief information officer (CIO) who uses a social networking site such as Facebook to connect with friends. It is not difficult to sign up and add friends; one can be up and running in no time. The same CIO knows that this process is fundamentally different from implementing a new—and untested—social networking tool designed to promote collaboration, communication, innovation, and improved employee productivity inside the organization.

Even assuming a successful new IT endeavor, there are no guarantees that the technology will have staying power. No chief technology officer (CTO) wants to spend millions of dollars on an IT initiative that turns out to be antiquated after a mere two years.

Historically, two types of organizations have helped organizations make sense of new technologies (or at least tried): large consulting firms and software vendors. Let's ponder the biases of each group. Consultants like me can offer guidance, but perhaps many organizations have viewed us suspiciously in the past. After all, we have a strong incentive to advocate all types of far-reaching (read: expensive) technological changes for our clients. For their part, traditional software vendors have always encouraged their clients to go in specific directions, again with a vested interest.

During the Great Recession, clients did not listen to either group to the same extent, as the financial results of each group reflected. With signs of the recession abating and the number of technological choices on the rise,

the best advice for organizations on how to navigate these waters may *not* stem from traditional sources.⁷

The Software Establishment

The late 1990s and early 2000s represented the halcyon days for many large software companies and consulting firms. ERP vendors such as SAP, PeopleSoft, Baan, and Oracle thrived as many organizations finally realized that their internal applications were antiquated and needed to be replaced by a single, integrated solution. The 1990s also represented the acme of Microsoft's hegemony. For their part, many systems integrators (SIs) such as IBM, CSC, D&T, Accenture, and PricewaterhouseCoopers (PwC) saw revenues and profits climb as their clients needed partners to help them implement new technologies.

Today, however, two things are certain. First, the heyday for many traditional technology heavyweights has long passed. Second, beyond their clients' shrinking IT budgets, many "old guard" technology vendors today are facing a number of significant threats to their revenue streams:

- SaaS
- OS software
- A new breed of independent software vendors (ISVs)

Note that neither this section nor book intends to demonize traditional software vendors. Emerging technologies pose major threats to many firms that were (and in some cases remain) powerful players.⁸ If history teaches us anything, it's that current stalwarts rarely embrace new technologies that will cannibalize their existing business models, especially early on. Displacement at the hands of new technologies has affected many industries and organizations with vested interests in maintaining the status quo. Looking back at the past 15 years provides a veritable litany of examples, including:

- Kodak's dismissal of digital photography until very late in the game
- Microsoft's longtime resistance to open source
- The reluctance of the music industry to accept digital music and the Internet as a platform for commerce
- The opposition of the telecommunications industry to accept voice over Internet protocol (VOIP)

⁷During the writing process, this struck me as one of the most important reasons for writing this book.

⁸I'm hardly the first to notice this.

This ethos is best exemplified in the words of Upton Sinclair: “It’s difficult to get a man to understand something if his salary depends upon his not understanding it.”⁹

Many of the aforementioned examples have been well documented. The next section uses the example of Lawson Software, an established mid-market ERP software vendor facing significant threats from new technologies.

SOFTWARE AS A SERVICE (SaaS) In recent years, few developments in the technology world have scared on-premises software vendors as much as SaaS. Salesforce.com founder and marketing whiz Marc Benioff has stirred up a great deal of controversy by openly talking about the “death of software.” Talk like that is not likely to go unnoticed, and Benioff is very aware of this.

Benioff is throwing down the gauntlet. He knows that on-premises software vendors have historically relied upon the following revenue streams:

- Costly software licenses, often on products purchased but not used (Aka “shelfware”)
- Annual support fees to the tune of roughly 20 percent of the initial license fee
- Consulting services
- Routine upgrades

For traditional vendors, SaaS is the very definition of a disruptive technology; if adopted en masse, it would eradicate a significant portion of their revenue and profits. It should be no surprise that many executives have viewed Benioff’s remarks as fighting words.

A jarring rebuke to Benioff’s comments recently came from Lawson Software CEO Harry Debes. Debes gave an interview on August 28, 2008, in which he dismissed the long-term viability of SaaS, arguing that it is essentially the application service provider (ASP) model revisited. Nor is SaaS an alternative to a license-and-support model at the very heart of his organization’s business model. Debes said, “SaaS is not God’s gift to the software industry or customer community. The hype is based on one company in the software industry having modest success. Salesforce.com just has average to below-average profitability. People will realize the hype about SaaS organizations has been overblown within the next two years. An industry has to have more than just one poster child to overhaul the system. One day Salesforce.com (CRM) will not deliver its growth projections, and its stock

⁹Upton. Sinclair, *I, Candidate for Governor: And How I Got Licked* (1935), repr. University of California Press, 1994, p. 109.

price will tumble in a big hurry. Then, the rest of the [SaaS] industry will collapse.”¹⁰

The natural question becomes “Is Debes right about SaaS?” At this point, it’s doubtful. SaaS has moved way beyond theory and into practice, as we will see in Chapter 6. I will, however, agree with Debes on the following point: For a variety of reasons, it’s unlikely that every on-premises client will supplant its core applications with SaaS equivalents. Some organizations will always want to control their applications and their data, refusing to cede control to a SaaS vendor even if they can reduce IT expenditures in the process.

OPEN SOURCE SOFTWARE OS has made inroads in many areas. As we will see in Chapters 5 and 16, OS alternatives have emerged to operating systems (Linux), productivity suites (OpenOffice), web servers (Apache), and many other applications. ERP may well be next.

Organizations such as Compiere sell customizable OS applications that their clients not only own but *control*. This is an important distinction. Clients of traditional ERP vendors purchase licenses but are in many ways at the mercy of their vendors’ upgrade and customization policies.

OS applications are fundamentally different than their commercial, off-the-shelf (COTS) brethren. Much like SaaS, OS circumvents a number of major complaints among clients of traditional vendors: forced upgrades, dangerous customizations to the plain-vanilla products, and unnecessary functionality.

An organization that wants to run an antiquated version of a finance and accounting system can do just that—sans the vendor’s pressure or requirement to upgrade. The organization can simply pay the vendor annual support fees without fear that its system will eventually be unsupported and risk potential system failure. I firmly expect the adoption of OS applications to continue rising in the next few years, further penetrating largely untapped markets such as ERP.

A NEW BREED OF INDEPENDENT SOFTWARE VENDORS Two recent and seemingly unrelated events have coalesced, resulting in more efficient software development. The first is the rise in the use of service-oriented architecture (SOA). In *Service Oriented Architecture for Dummies*, Judith Hurwitz, Carol Baroudi, Robin Bloor, and Marcia Kaufman describe the SOA world as one in which “business applications are assembled by using a set of building blocks known as components—some of which may be available ‘off the shelf,’ and some of which may have to be built from scratch.”

¹⁰See <http://seekingalpha.com/article/93066-lawson-s-harry-debes-saas-industry-will-collapse-in-two-years>.

In other words, SOA provides greatly enhanced methods for systems development and integration. Individual systems and components give way to business processes and interoperable services. SOA allows different applications to exchange data with one another as they participate in business processes. Service orientation stitches together ostensibly different services with operating systems, programming languages, and other technologies underlying applications.

Second, the passage of the Sarbanes-Oxley Act¹¹ (SOX) has resulted in many organizations abandoning efforts to build their own internal systems. Faced with SOX's increased audit requirements, many are now opting to use independent software vendors (ISVs) to build proprietary systems. As organizations have increasingly sought the external expertise of ISVs in creating applications, it should not be surprising that organizations such as Infosys have prospered. (From its initial public offering in 1993 to 2007, the company's stock grew 3,000 percent, absent dividends.)

The end result is that successful IT projects are not uncommon these days—even if well-documented failures still persist. (Infosys's stock would not have climbed so high without high client reference and retention rates.) Unlike the 1980s, few organizations these days want to reinvent the wheel, finally accepting that they should stick to their knitting and not build applications from scratch. More organizations are using ISVs to build custom applications that address specific business needs, especially when those apps can be relatively easily integrated into existing system infrastructures. No longer are they forced to choose among a small number of viable alternatives.

REACTIONS TO DISRUPTIVE TECHNOLOGIES For traditional software vendors, SaaS, open source, and the new breed of ISVs have collectively prompted an important question: Given potential challenges to their business models, how can these firms respond to such highly disruptive technologies?

Predictably, the reactions have fallen into three general categories:

- Denial of all threats
- Wait and see
- Acceptance the lesser evil

Denial of All Threats Lawson clearly falls into this camp, as evinced by what Debes is asking his clients to do:

¹¹In *Sarbanes-Oxley and the New Internal Auditing Rules*, Robert Moeller calls the 2002 passage of Sarbanes-Oxley “the most major and radical set of financial auditing changes in the United States since the 1930s[.] SOX has caused radical changes and strong new rules for public accounting, corporate governance, and others.”

- Embrace certain Enterprise 2.0 technologies such as BI and enterprise search and retrieval (ESR). Naturally, Lawson makes products in these areas.
- Ignore a major and potentially game-changing technology, hoping that it will ultimately fail.
- Cling to existing on-premises applications, presumably with his company.

Reading between the lines, Debes's comments suggest that SaaS and open source frighten him. I for one find it curious that he is so effusive about certain technologies and so dismissive about others.

Wait and See Many software vendors are waiting for certain dominoes to tumble. Software companies know that their clients aren't fond of them pushing new wares and changing "strategic" directions every year. If not executed properly, these pushes can have dire consequences, primarily driving their clients toward increasingly viable alternatives, such as SaaS and OS. What's more, it takes a great deal of time and money for vendors to rewrite their apps for different platforms. It's certainly reasonable for them to exercise prudence.

Acceptance of the Lesser Evil Some software vendors see the writing on the wall and are effectively asking themselves, "How can we find opportunity in this chaos?" In other words, they understand that, as technology changes, so do their clients' needs. For example, consider two 800-pound gorillas in the software world:

1. SAP, which finally got SaaS religion in early 2009¹²
2. Oracle, whose CEO, Larry Ellison, has embraced the SaaS model for many of his organization's myriad applications

These two companies have recognized the immediate threats that these disruptive technologies are posting to their respective client bases. They realize that their clients may jump ship if they tire of on-premises software, preferring to use a different model altogether. SAP and Oracle know that clients dissatisfied with their offerings are now able to:

- Move to a SaaS vendor.
- Build a new software solution with an upstart ISV.
- Go the OS route.

¹²See www.informationweek.com/news/services/saas/showArticle.jhtml?articleID=217800410.

With respect to the above, SaaS is probably the lesser of the three evils. Oracle and SAP seem to be abiding by the US Marines motto, “Follow, lead, or get out of the way.”

THE END RESULT: GREATER ORGANIZATIONAL CHOICE The threats facing established software vendors are already changing the dynamics of the traditional vendor-client relationship. Unlike a few years ago, organizations running mature applications with varying degrees of success now have much greater choice in the marketplace.

Many organizations have long waited for this day for a number of reasons. First, for years they have resisted their vendors’ mandates that they routinely upgrade to more mature versions of applications, lest those applications be decommissioned and unsupported. Second, many organizations have been regularly paying their vendors annual support on unused applications, in effect wasting thousands of dollars per year. Third, IT departments must devote often considerable time, personnel, and expense to system maintenance, such as applying application patches and creating data areas to test upgrades.

To be sure, the increase in the number of different viable technologies for organizations is a largely positive event. Greater choice means lower prices for organizations, greater product innovation, more features, and an overall more efficient marketplace.

As just one of many possible examples, an organization in the mid-1990s was essentially forced to use Microsoft Windows as its operating system (OS) and Office as its productivity suite. Fast forward to 2009. Organizations unwilling to purchase and use Microsoft products have many alternatives. A bevy of options now exists for enterprises with respect to different types of systems, applications, databases, and technologies. Tool such as Google Docs and OpenOffice are arguably valid alternatives to MS Office. While its hegemony on the desktop OS front remains largely intact, Microsoft cannot ignore potentially legitimate alternatives to Windows such as Linux, Apple’s Mac OS X, and Google’s Chrome OS.

Against this backdrop, the question remains: How can organizations manage the chaos caused by all of these new technological options? A dizzying array of choices can cause confusion. Say what you will about monopolies; at least they remove the opportunity for an individual or enterprise to make the wrong choice. A similar logic exists among those who believe that the world was a safer place during the Cold War. The rationale is that the United States knew its enemies in those days: the USSR and Communism. According to this argument, the fall of the Soviet empire created a murkier world.

Electronic Health Records: A Case in Point

Given the financial crisis over the past two years, few mainstream economists embrace a laissez-faire mentality these days. On a general level, most mainstream practitioners of “the dismal science” call for some degree of government intervention to prevent future disasters and certainly when markets have failed to act efficiently.

One could argue that there has been no greater market failure over the past 50 years than the U.S. health care system. This is the elephant in the room, as the following figures from the National Coalition on Health Care suggest:

- In 2008, total national health expenditures were expected to rise 6.9 percent—two times the rate of inflation.
- Total spending was \$2.4 trillion in 2007, or \$7,900 per person.
- Total health care spending represented 17 percent of the gross domestic product (GDP) in 2007.
- U.S. health care spending is expected to increase at similar levels for the next decade, reaching \$4.3 trillion in 2017, or 20 percent of GDP.¹³

Health care reformers have been advocating change for years. For starters, many have asked the question: Would the U.S. health care system benefit from electronic health records (EHRs)?

The answer is an unequivocal “yes.” Karen Bell, director of the Office of Health IT Adoption at the U.S. Department of Health and Human Services, said as much in an interview in September 2008. She noted that many “health care . . . problem(s) could be solved, or at least drastically reduced, by electronic health records, which allow data to be easily shared among physicians, pharmacies, and hospitals. Such systems help coordinate a patient’s care, eliminating duplicate testing and conflicting prescriptions, and ultimately cutting costs. But despite the benefits, only 15 to 18 percent of U.S. physicians have adopted electronic health records.”¹⁴

In other words, nowhere is the technological chasm between the possible and the status quo arguably more pronounced than in EHR, an area in which the United States has been sorely lacking for years. But is EHR a reality? What can we learn from successful case studies?

Let’s look at the Frederiksberg University Hospital in Copenhagen, Denmark, recently featured in a *Time* magazine article by Eben Harrell. It is an example of a health care institution that has successfully gone digital.

¹³See www.nchc.org/facts/cost.shtml.

¹⁴See www.technologyreview.com/biotech/21428/#afteradbody.

Harrell writes that “in the hospital’s Department of Acute Medicine—where patients often arrive unconscious or disorientated—Klaus Phanareth’s PDA prevents him from prescribing dangerous medications ‘on a weekly basis,’ he says. ‘There’s no doubt that it (EHR) saves lives.’”¹⁵ It’s interesting to note, however, that even digital hospitals in Denmark do not share electronic information with one other—i.e., they are not “interoperable” as of this writing.

Frederiksberg has managed to find opportunity in chaos. While other examples abound, the alarming fact remains: Despite incontrovertible financial benefits, fewer than one in five U.S. health records had been digitized as of 2008.

What are the possible reasons that so many U.S. health care organizations have resisted EHR? Some possibilities include:

- Technological limitations.
- Unclear guidelines.
- Economic incentives.
- Institutional barriers.

TECHNOLOGICAL LIMITATIONS One cannot credibly cite technology limitations as a culprit for EHR’s general lack of adoption in the United States. For years, the systems, applications, specific technologies (such as OCR¹⁶), and security have existed for hospitals and doctors’ offices to go from paper to computer—if they chose to do so. The Frederiksberg University Hospital is a hardly a unique case in point.

UNCLEAR GUIDELINES The importance of clearly defined terms on a project as complex and important as EHR cannot be overstated. As a result, many health care organizations can hardly be faulted for not giving the green light to EHR initiatives when fundamental precepts have not been defined. Such is the case here. Only in April 2009 did the Healthcare Information and Management Systems Society (HIMSS) publish two definitions of *meaningful use* as it applies to certified EHR technologies and hospitals’ use.¹⁷

¹⁵See www.time.com/time/health/article/0,8599,1891209,00.html.

¹⁶In his book *Adaptive Technologies for Learning & Work Environments*, Joseph J. Lazzaro writes that optical character recognition (OCR) “systems transmit printed material into your personal computer, allowing you to read the material in the mode you find most comfortable and appropriate. Once you have scanned a book into your computer, you can read the text using speech, Braille, or magnified output. You can also transmit the text to a note taker for use on the road.”

¹⁷See www.healthcareitnews.com/news/himss-publishes-meaningful-use-definitions.

Without such definitions, hospitals may find themselves in court over misuse of confidential patient information.

According to its web site, “The Healthcare Information and Management Systems Society (HIMSS) is the healthcare industry’s membership organization exclusively focused on providing global leadership for the optimal use of healthcare information technology (IT) and management systems for the betterment of healthcare. . . . HIMSS frames and leads healthcare public policy and industry practices through its advocacy, educational and professional development initiatives designed to promote information and management systems’ contributions to ensuring quality patient care.”

Still, it is very difficult to believe that the lack of clear guidelines has served as the sole barrier to many organizations’ desire to go digital. If that were the case, then it is unlikely that HIMSS would have waited until nearly 2010 to step up to the plate. Along with technological limitations, this factor seems minor in explaining the status quo of EHR in the United States.

ECONOMIC INCENTIVES AND INSTITUTIONAL BARRIERS Let’s address the financial and institutional causes together, as they are essentially impossible to separate. Is there a marked financial incentive for health care institutions to go digital? The answer is a qualified “yes.”

In the same *Time* article, Jeff Harris of the American College of Physicians points out that U.S. family physicians have the highest administration costs in the developed world and “are already under strain from all the paperwork required to run an office.”

The economics of health care are more nuanced, however. While significant financial incentives exist for organizations to adopt EHR, many have not because of the industry’s unique economics. Private insurance, government programs such as Medicare and Medicaid, and the relative inelasticity of demand¹⁸ for health care have long lessened many institutions’ perceived need to change in general—and adopt EHR specifically.

Moreover, the lack of successful U.S. deployments of EHR makes many executives wary. Aside from the cost of adopting EHR, breach of confidential personal health records seems like a perfectly reasonable reason to postpone its adoption. To this end, President Obama’s \$19 billion earmark in the 2009 stimulus plan for health information technology (HIT)¹⁹ attempts to address the widespread institutional reluctance of organizations to adopt EHR.

¹⁸In simple English, elastic demand is very sensitive to price. If Big Macs become too expensive, then customers will flock to Burger King. Conversely, gas has a relatively inelastic demand and always will have until electric cars become more prevalent.

¹⁹See http://ces2010.digitalhealthsummit.com/index.php?option=com_myblog&show=Stimulus-Package-Contains-19-Billion-for-Health-Information-Technology-Telehealth.html&Itemid=5.

Perhaps Obama's carrot along with public pressure to reduce health care expenditures (the stick) will help attack institutional resistance to change in health care. One thing, however, is certain: Hospitals and doctors that embrace EHR will realize enormous benefits from going digital—increased profits and efficiencies, reduced costs and errors, saved lives, and so forth. Many currently don't understand how to successfully adopt these technologies. They don't know how to find opportunities in the chaos.

In a nutshell, that is the objective of this book.

Summary

As a general rule, senior managers in risk-averse organizations believe that “if it ain't broke, don't fix it.” Even before the Great Recession, these decision makers were likely to maintain their organizations' legacy systems, traditional software architectures, and often-antiquated applications for the foreseeable future. These laggards avoid—or, at the very least, postpone—change increasingly at their own peril.

As SaaS, BI, agile development, cloud computing, and the like mature and business pressures intensify, most organizations will no longer have the luxury of maintaining a wait-and-see approach with regard to upping their IT ante. There are a number of reasons for this eventual shift:

- Senior managers will not be able to dismiss the carrots offered by these new technologies: increased revenue, innovation, and cost savings.
- The sticks of not using them will be too significant to ignore: organizational decline, loss of market share and profits, and possible extinction.
- The ease of adopting them will negate naysayers' main argument: “No one else is doing it.”

Together, these three realities are already sparking the question in many progressive organizations: “Should we consider using these new technologies?” Increasingly, this query will be replaced by a different set of questions:

- What are the costs and benefits of using them?
- What can they do for our organization?
- How can we effectively use them?
- How can we avoid making the mistakes that others have made?

This book endeavors to answer this latter set of questions.