MIT

Massachusetts
Institute of Technology

Winter 2000

Volume 41
Number 2

SLOAN
Management Review

Michael Earl &
David Feeny

How To Be a CEO for the Information Age

Reprint 4121

Opinion

How To Be a CEO for the Information Age

Michael Earl ▪ David Feeny

As many CEOs struggle to understand their role in IT strategy, their careers and companies hang in the balance.

Michael Earl is professor of information management at London Business School and director of the LBS Centre for Research in Information Management. David Feeny is vice president of Templeton College, Oxford, and director of the Oxford Institute of Information Management.

By now the vast array of Web applications for supply-chain integration, customer relationship management, salesforce automation, work group collaboration — and the sale of everything from equities to automobiles — should make it perfectly clear that information technology has evolved beyond the role of mere infrastructure in support of business strategy. In more and more industries today, IT *is* the business strategy.

The implications for existing and aspiring CEOs are equally clear. Information technology is now a survival issue. Board and executive team agendas are increasingly peppered with, or even hijacked by, a growing range of IT issues. They may be explicitly IT — the company's progress towards millennium compliance, the IT consequences of a merger or acquisition, the desired profile of a new CIO — but more and more frequently IT issues are now wrapped inside wider questions of business strategy.

What is the e-commerce opportunity for our business and how do we organize for it? As we seek to "think global and act local," must we commit to a new generation of enterprise-wide IT systems? What combination of organizational change and new technology is required for a breakthrough in knowledge management? As one CEO said to us recently, "Nearly every strategic issue we address is now triggered by IT or has consequences for IT." Or as one CIO put it, "Whenever anything to do with business change is on the agenda, I get called in because IT is on the critical path."

Today, CEOs can neither avoid IT nor delegate the issues it raises to others. Business strategy and IT have become so intertwined that large corporate IT failures frequently lead to the demise of the CEO. In the Information Age, IT issues must be proactively embraced. Unfortunately, most CEOs are ill-equipped for this new world. Indeed, surprisingly few provide the necessary leadership.

One oft quoted reason is the "generation gap." We need CEOs who have grown up in an IT-oriented world, goes the thinking. That is not our experience. We have studied and observed CEOs who have clearly made the transition to the Information Age without being born into it. They will serve as our role models as we describe what is required and how it is achieved. Because their experiences illustrate the importance of attitudes towards IT — in contrast to hands-on IT skills — we think of them as "IT believers" rather than "IT-literate CEOs." We can begin to understand believer CEOs by first contrasting them with other CEOs who are demonstrably "unfit" for the Information Age.

Consider the following archetypes we have developed from watching and conducting research with CEOs around the world. While they seem like caricatures, we have found that they and their colleagues can easily recognize their behaviors.

• *The Hypocrite.* A CEO invited specially chosen senior business managers and IT executives from around the world to a one-day meeting to debate "Internet strategies." In his welcome address, he stressed that this was possibly the most critical issue facing the business for the next decade. He then announced he must attend to an urgent problem and was unlikely to rejoin the meeting for the rest of the day. He claims to believe that IT is strategic but he demonstrates the opposite by his actions. He is a hypocrite.

• *The Waverer.* A major IT project failed at a manufacturing company. The board realized it would have to implement another integrated production planning and control system if the company were to survive. The CEO fully subscribed to this view. The board suggested he demonstrate strong support for the project and provide visible leadership for all future IT initiatives by having the CIO report to him. The CEO refused. "I haven't got the time," he said. "Who else is willing to take on this responsibility?" This CEO is a waverer. He reluctantly accepts the importance of IT to business development and survival but will not make it a personal priority.

• *The Atheist.* A CEO famed for his leadership and visionary qualities championed IT as a critical enabling resource in his science-based business. When he retired, his successor was keen to be seen differently. He went around the company publicly decrying the cost of IT, ridiculing the IS function, and advocating a return to basic principles of business, rather than IT pipe dreams. He is an atheist. Convinced that IT is irrelevant to competitiveness, he not only downplays IT as a strategic resource but publicly opposes contrary beliefs.

• *The Zealot.* A newly appointed CEO of a fast-moving consumer goods (FMCG) company inherited a business that had gained market share by outperforming rivals in supply-chain management and retailer shelf replenishment — successes based on early use of electronic data interchange (EDI) with customers, reliable inventory control systems, responsive reordering routines, communications-dependent logistics systems and a reengineered supply-chain process. The incoming CEO believed the underpinning IT infrastructure was not sufficiently integrated nor capable of handling business growth. The IS staff argued differently, but the CEO overruled them. He then personally selected and sponsored a third-party systems vendor to replace the infrastructure. The project was technologically over-ambitious and failed. "It was the biggest and most expensive mistake in my career," the CEO reflected. We might have labelled him a convert, in that, like many converts, he became dogmatic in his views, would not consider other opinions and followed up his unshakeable belief with bold actions. But since he was so uncompromising and partisan, we prefer to call him a zealot.

• *The Agnostic.* A CEO recognized that IT was increasingly central to his manufacturing business. He became even more convinced of the importance of IT when he moved to a financial services business. Despite these insights, he was extremely cautious about IT. "Don't ask me to exhort or encourage investment in IT," he would say. "IT investments must be driven by a good business case, and I want to see some track record of success before I believe it." This hard-nosed, even common-sense, attitude resonates with many CEOs. Unfortunately, this CEO is an agnostic. He concedes IT may be important but is not prepared to back his instinct in the absence of a "watertight" business case.

• *The Monarch*. Another CEO believed IT was critical to both the operations and growth of his insurance business. He appreciated that "getting IT right was not always easy" and that risks are involved. He even observed that the "CIO has the most difficult job in the company." Thus, quite rationally, he sought to recruit the best CIO he could find — and before long hired a replacement. In each case, however, he transferred responsibility for IT to a competent specialist — instead of taking responsibility himself with help from a specialist. We think here of a British concept, that of Monarch — the person who appoints the leader of the established church in England, but remains the symbolic head. Monarch CEOs believe in the importance of IT, will appoint the best people and sanction necessary resources, but they expect the CIO to provide both IT strategy and IT operations in a principal-agent relationship.

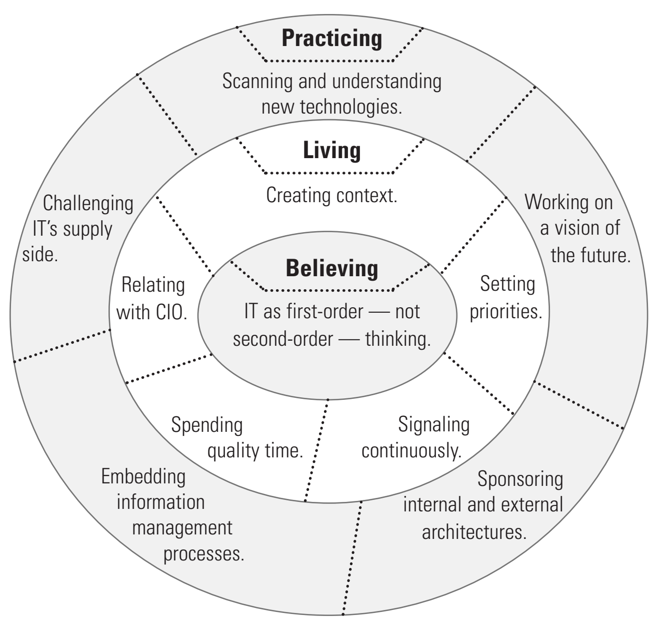
• *The Believer*. A new CEO took the helm at a bank in decline. He reviewed the bank's competitive strategy and the current recipes in the industry. He found his rivals were all using IT in similar ways and on traditional applications. He concluded that if he could think differently and use IT as a source of differentiation, even changing the economics of the industry, he might rescue the bank. For him IT became an enabler of strategic renewal and innovation. Over time he espoused this belief in strategy workshops, company conferences, even in published articles. He devoted quality time to IT leadership in the business and developed a close relationship with his CIO. This CEO had faith in IT as a source of competitive advantage and committed his time and attention to making it happen. We call him a believer.

These vignettes describe generic cases of CEOs who today are faced with the challenge of providing IT leadership. (See *Table 1* for summaries of the seven IT creeds they represent.) Only the last example, the "believer," seems to us a CEO fit for the Information Age — particularly when we examine what he, and some similar CEOs *believe* about the business value of IT, how they translate their beliefs into action, how they *live* their faith every day, and how they *practice* what they preach. We suggest that belief drives living and that daily living largely determines the quality of leadership practice. We examine each of these layers in turn *(see Figure 1)*.

Table 1
Seven IT Creeds of the CEO

Archetype	Characteristics
Hypocrite	Espouses strategic importance of IT. Negates this belief through personal actions.
Waverer	Reluctantly accepts strategic importance of IT. But not ready to get involved in IT matters.
Atheist	Convinced IT is of little value. Publicly espouses this belief.
Zealot	Convinced IT is strategically important. Believes he or she is an authority on IT practice.
Agnostic	Concedes IT may be strategically important. Requires repeated convincing.
Monarch	Accepts IT is strategically important. Appoints best CIO possible, then steps back.
Believer	Believes IT enables strategic advantage. Demonstrates belief in own daily behavior.

Figure 1
Diagnosing the CEO Who Is Fit for the Information Age



Believing the Information Age

CEOs who already demonstrate their fitness for the Information Age share a common and intuitive belief. They see IT as a first-order factor of strategy making, not second-order. What do we mean?

A second-order mind-set acknowledges that IT investments and applications may be needed to support business strategy. This is often characterized as the alignment problem — ensuring that the right IT applications and infrastructure are in place to support the current business strategy and prevent inappropriate investments in technology.

Belief in the business-critical role of IT drives what believer CEOs do and the organizational climate they create.

However, today alignment needs to be conceived as a two-way question. IT and the digital convergence of information media can create new business opportunities and threats. Quite simply, you can't begin to imagine and build the future of your business without considering the impact and potential of IT. The rise of the Internet and the rapid development of e-commerce demonstrate the point. The few CEOs we have seen who think this way — the "believers" — are convinced that IT can and will change business. They ensure that IT threats and opportunities are placed high on their strategic agendas. They devote personal time to understanding how their business and their industry will evolve as the Information Age unfolds. And, by both exhortation and example, they encourage their managers to do the same.

Belief in the business-critical role of IT drives what believer CEOs do and the organizational climate they create. It influences how they live and what they practice. We chose religious metaphors to describe our archetypal CEOs because the first-order thinking about IT and strategy by believers is so deep-seated. Indeed, it is often a quite unshakeable conviction akin to faith. Question their conviction and believers will provide sound business answers; probe more deeply and you will find their conviction is based on instinct and belief. Six examples show what we mean.

Many years ago, Alastair Grant — former CEO of Safeway, the U.K. food retailer — turned to IT as a source of differentiation. Safeway was a late entrant to supermarket retailing, and Grant looked for ideas or resources that its more established rivals were not fully exploiting. To be sure, no supermarket chain was operating *without* IT, but equally none was aggressively exploiting information and systems to conduct business differently — much less significantly improve the customer experience. Since then Safeway has introduced one innovation after another, recent examples being customer loyalty cards, hand-held customer scanners and sharing sales data with allies. Much of this was made possible because the company has always built flexibility into its systems that might pay off later in the ongoing competitive battle of retailing. By coupling flexible systems with a guiding business principle — "never throw away data" — Safeway challenges conventional wisdoms of retailing with new technologies. For instance, it has learned how to make sales promotions pay by smart analysis of customer databases and has piloted unusual store services because it can analyze benefits from its sales data.

In 1988, Peter Schou, chief executive of Lån & Spar Bank in Denmark, came to the first-order belief in IT in a similar way. With declining profits and a 0.3 percent market share in an over-banked economy, he had to do something radical. He reasoned that through technology he could change the economics of retail banking by creating a direct bank, while outcompeting rivals on quality by providing customers account information and interactive services. He understood that the stream of new technologies would not dry up, making continuous innovation possible. Imitation by rivals would not be an Achilles' heel. This analysis made him confident that he was unlikely to be wrong — and made him willing to pioneer technology in his sector. He supported these efforts with a flat, empowered organization and effective public relations–based advertising campaigns. Over 5 years, profit rose by more than 200 percent, and market share grew tenfold.

Toshifumi Suzuki, former CEO of Seven-Eleven Japan, the convenience store chain, had similar first-order beliefs. Using what is described elsewhere as the mind-set of "strategic instinct,"[1] Seven-Eleven Japan has pioneered rapid response supply-chain management over 20 years through continuous innovation. Suzuki focused on customer satisfaction, product quality, and service. He embraced IT — together with building a highly trained field sales team — to

Critics might argue that we draw our believer CEOs from information-intensive sectors; but examples abound in traditional industries as well.

redefine competitive benchmarks on these three factors of retail performance. Moreover, he has throughout conceptualized Seven-Eleven Japan as an Information Age business. "Seven-Eleven Japan is not in the retail business. It is in the information business," says Suzuki. Today, the company works with the Nomura Research Institute and numerous IT vendors to pioneer the introduction of new technologies into Japanese retailing. Such information-oriented conceptualizations of the business are the hallmark of "believers."

Ralph Larsen, chairman of Johnson & Johnson, suggested to analysts that "We are not in the product business, we are in the knowledge business." Larsen champions the introduction of global, corporate-wide IT infrastructures and common systems to create efficiency and knowledge-sharing synergies in what has traditionally been one of the world's most decentralized companies. Larsen's belief, however, is not that of an IT freak. He understands that smart use of information can transform both research and development and sales management.

Likewise when James Wolfensohn, president of the World Bank, announced that "We need to become, in effect, the 'Knowledge Bank,' a series of transformational actions followed: investment in groupware, appointment of a CIO, and the launch of a knowledge management program coordinated by a newly appointed chief knowledge officer.

Critics might argue that we draw our believer CEOs from information-intensive sectors; but examples abound in traditional industries as well. John Browne, CEO of British Petroleum, has shown that Information Age thinking can apply to process industries. He believes that to ignore the potential of information technology is to reject both value-realization and value-creation opportunities. He expects to raise productivity by using IT to reduce production and information costs. More radically, he too conceives of BP as a knowledge business. "In order to generate extraordinary value for shareholders, a company has to learn better than its competitors and apply that knowledge throughout its businesses faster and more widely than they do," says Browne.[2] Interestingly, when challenged on the economies of scale expected from the recent merger with Amoco, he remarked that the most significant returns were likely to come from knowledge sharing. In 1998 he also set a target for BP's IT function; he expects 25 percent of BP's profit growth in the next 5 years to come from exploiting smart technologies. Among other things, BP is seeking to invest in oil-related information and Internet businesses. This is not the drive from a CEO who sees IT investment as necessary to support business strategy. It is the drive that comes from believing that IT allows you to compete differently from Industrial Age or traditional models of competitive strategy.

Indeed, each of these examples demonstrates an important, yet subtle, facet of first-order belief. "First order" means that CEOs look to IT for ways of doing business differently — or even being in different businesses — rather than thinking strategy first and technology second. Such thinking drives the CEOs of today's leading Web-based businesses. Jeff Bezos of Amazon.com built and continuously develops his business on the back of IT and information-processing capabilities. Michael Dell pioneers new paradigms of order processing and supply-chain management, because he knows IT can change the economics of these fundamental business processes. However, none of these believer CEOs sees IT as a source of value creation in its own right. They conceive of new possibilities by deploying IT in tandem with other business changes. They understand that IT *enables* new models of doing business, whether it's customer-centered retailing, direct and service-oriented banking, knowledge-based pharmaceuticals, learning-intensive petrochemicals, or Web-based distribution. IT alone is not sufficient, but without IT less is possible.

Such first-order belief is not just another strategic rhetoric or leadership mantra, however. IT drives how CEOs fit for the Information Age conceptualize and guide their corporations. It influences how they behave (or live) and what they do (or practice). It is the core of our model CEO (see Figure 1) and, without such belief, the outer layers of living and practicing are unlikely to be enacted or sustained; instead, a CEO will likely regress into one of the other six IT creeds we depict.

Living the Information Age

Our religious metaphors allow us to ask the crunch question of CEOs. "Okay, you say you're a believer. Do you live your faith every day?" To test whether you're answering honestly, consider the following five aspects of living that all true believers follow.

Creating Context

The first behavior we consistently observe in believer CEOs is that they create a context of positive hunger for change. Successful exploitation of IT involves new ways of doing things and ventures into unknown territory. To combat resistance to such uncertainty, believer CEOs proclaim and promote "stretch" goals for the business. Michael Dell sets targets for the proportion of Web-based order taking, for example. When Land Rover was developing its new SUV, the Freelander, CEO Ian Robertson set goals for time-to-market and manufacturing flexibility that were beyond the company's previous experience. He also pronounced that "there are no sacred cows in achieving the Freelander project," thereby encouraging the project team to embrace new technology-enabled processes as the most viable way forward. To meet such goals, it is clear that change is inevitable: the old ways will not do; new ideas are welcome; IT is a possible tool.

Atheist CEOs generally create a climate of respect for the established wisdom of the industry — and suspicion of newfangled ideas.

Several CEOs of Web-based businesses demonstrate par excellence this focus on change. "This is business in real-time, where nothing can wait until tomorrow or even until after lunch," says Jomei Chang, CEO of Vitria Technology. And Michael Dell says, "Our goal is to be one or two steps ahead of the change, and, in fact, to be creating or shaping it to some extent."

Atheist CEOs, by contrast, generally create a climate of respect for, and adherence to, the basic and established wisdoms of the industry — and suspicion of newfangled ideas. Agnostics are open-minded about change, but lacking in leadership towards it. By the time new methods have met the burden of proof, it is often too late to catch up.

Setting Priorities

Innovation and IT exploitation also thrive when there is a clear and lasting business focus, allowing the implementation of one idea to provide the spark (and often the technology platform) for the next three. Believer CEOs meet this need by highlighting a small set of business priorities whose importance they consistently reinforce over a period of time in their words and behaviors. For the first several years of Sir Colin Marshall's tenure at British Airlines, everybody in the company knew that "customer first" was the priority. It stimulated development of new IT applications and provided a criterion for selecting between competing IT investment opportunities. For more than 20 years at Seven-Eleven Japan, CEO Suzuki stressed convenience, quality, and service as the themes for the company in general and IT in particular.

The damaging and common alternative is the "corporate initiative of the month" syndrome in which (usually waverer, agnostic, or hypocrite) CEOs "play safe" by declaring a large, disparate, and changing set of priorities. In these circumstances, there is never the time, commitment, or focus to sustain the development of the IT systems and infrastructure required to support radical improvement in business performance.

Signaling Continuously — and Positively

CEOs differ from other members of their organization in one important aspect. The CEO's beliefs cannot be private. In speeches, documents, meetings, and daily interactions, the CEO signals his or her beliefs, like it or not. Positive signals about the importance of IT — and what is expected of everyone involved — are critically important.

When BP's John Browne talks externally about learning, knowledge, and IT, he sends a powerful signal about what matters. Most executives are skilled at watching out for what CEOs say in order to understand the real or emerging agendas. When Browne says publicly "Information technology is wonderful because it makes rich exchanges possible without formal structures,"[3] it forces his managers to think about the vision Browne has in mind, while deterring cheap gibes about the irrelevance or disappointments of IT.

Of course, internal communication must support external messages. Jack Welch at GE has convictions similar to Browne's. "Information technology must become the central nervous system of any enterprise that expects to be a winner in the next century," he argues.[4] How does Welch reinforce this message? Whenever he hears from a divisional CEO about a successful knowledge management project, he asks, "What have you done to share your success and learning with other divisions?" In this way, he not only signals interest, but sets expectations of collective learning and transfer of best practice.

Obviously, negative signals can be sent very easily, either by accident or design. Think of our hypocrite CEO who left the meeting on Internet strategies after making a token appearance. Recall the monarch CEO who, when planning executive meeting agendas, frequently asked, "Do we have to have IT items at these meetings?" And remember the waverer CEO who occasionally pronounced the importance of IT and rehashed his favorite success stories, but whenever he visited his companies and saw new IT applications or infrastructure would only ask, "How much did that cost?"

So when we suggest continuous signaling from the CEO is key, we do mean *positive* signaling!

Spending Quality Time

CEOs are busy people with many demands on their time. Many IT issues are not routine, and the IT environment is changing all the time. It is easy for IT to be relegated lower on the CEO's agenda or even to fall off altogether.

Believer CEOs, however, take their IT leadership role seriously and invest quality time in IT matters.

First, they are noticeably engaged in thinking — and frequently writing — about how IT will impact their industry and the opportunities it brings to business. When they reflect on the "big picture," IT and information are on their mind. Typically, believer CEOs are well-read students of technology trends and new business models for the Information Age.

Second, as managers, they prepare thoroughly for meetings that will involve IT issues. They read committee papers and seek briefings from the CIO and other relevant executives. Some consult mentors or personal gurus for advice. Above all, believer CEOs set clear examples for colleagues regarding the need to give quality time to IT. Some years ago, BP's John Browne put a technical issue — choosing a new database management system — on the board's agenda. An arcane issue to some, Browne used it to convey his vision of the importance of IT and to signal that some technical decisions influence what can and cannot be achieved. By example, he encouraged all the directors to devote quality time to such issues.

Believer CEOs set clear examples for colleagues regarding the need to give quality time to IT.

Browne created an environment in which BP's board members and executives would not hesitate to grapple with IT-related issues since they now realized there may be important business consequences. Another proponent of leading by example is Peter Schou at Lån and Spar Bank. Schou took responsibility for dealing with the two banking infrastructure utilities in Denmark because he knew that decisions about service levels, cost structures and infrastructure design could influence the performance, profitability and growth of his bank. Such deep involvement conveys important signals; it also is an important means of learning for the CEO.

Contrary behavior is illustrated by the hypocrite CEO who schedules IT topics for executive committee meetings that he won't attend and by the monarch CEO of a financial organization who "trusts" the IT people on systems questions (that is, on Year 2000 compliance!) — a sure-fire indicator that he won't allocate the necessary time.

Many CEOs believe they give quality time to IT and point to a constant barrage of strategic and operational IT problems as proof. Believer CEOs, however, proactively address IT issues and opportunities, rather than reacting to problems as they arise.

Working Closely with Your CIO

It is conventional wisdom nowadays that the CIO should report to the CEO. This could work well if the CEO were a believer; it might be less fruitful if the CEO were a follower of any one of our other six creeds! However, our prior work has indicated that a good relationship, formal or informal, between the CIO and CEO is key to ensuring that IT is regarded and exploited as an asset.[5] Believer CEOs invariably work closely with their CIO.

When John Browne encouraged the IT function in BP Exploration to undergo a program of transformation as a model for the rest of the business, it was difficult to tell who was the driver — Browne or CIO John Cross. Each credited the other with ideas and energy. Likewise Schou will take his CIO, Carsten Colfach, with him to important external meetings involving banking systems and technology. Colfach, in turn, expects to be able to call on Schou when he needs high-level business support or involvement. Conversely, it is now legendary that Schwab's entry into e-brokering began when CIO Dawn Lepore took CEO Charles Schwab to see an internal demonstration of how Web-based customer channels could be linked to back-office mainframe systems.

The aim is to build a two-way relationship in which the CEO can challenge or question IT thinking as well as provide business direction for IT and, importantly, in which the CIO can challenge business thinking as well as provide IT direction for the business. Cross began to see his role as partly a "thought leader" while Browne was always laying down challenges for BP's IT function. As one CIO put it, "I need to know the CEO's expectations of me, and he needs to know my expectations of him."

Such value-adding relationships are rare. "I can't talk to my CIO" is a frequent cry of despair from CEOs. A recent letter from a CIO tells the other side. He is frustrated at not being able to engage his (agnostic) CEO in "discussing information systems as part of the solution to the business problem . . . rather than as a controllable cost." Of course, relationships are two way — it takes two to tango. But imagine the uphill task one CIO faces. A hypocrite CEO, observing how important IT was becoming in his business, said to one of us, "I think we have an IT director now." Turning to the company's finance director, he added, "Remind me what his name is."

Practicing the Information Age

Living the Information Age comprises a set of subtle, soft behaviors that over time become obvious and deep within the organization. Practicing the Information Age involves five more active behaviors, all matters of strategic business development.

Scanning and Understanding New Technologies

Because of their first-order thinking, believer CEOs study rather than avoid technology. They devote time to scanning new and emerging technologies and to reflecting and talking extensively to others on how

Believer CEOs realize that the technology does not determine the application.

those technologies might impact their own industry and business. For example, John Browne of BP accepted the invitation to join the board of Intel partly to better understand chip technology and the challenges of high-tech business. Peter Schou of Lån & Spar Bank ensures that he attends the principal global conferences on banking technologies; he visits other companies that have pioneered innovative IT applications; he is an active sponsor of the high-tech laboratory of a business school; he even writes his own strategic analyses of key technological turning points, particularly those relevant to direct banking. A more "in your face" position is taken by co-CEO of Schwab, David Pottruck, who issues the following challenge: "How can you lead your company into this new era if you're not conversant and comfortable with this new technology?"

The initial emphasis is on grasping the concepts and trends in technology. What are the basic ideas involved in Internet, intranet, and extranet technology? In data warehousing? In virtual reality? What are the development directions and trends in each case, the forecast of changes in the technology's functionality and price/performance?

The bigger challenge is then to foresee the potential business implications. Believer CEOs realize that the technology does not determine the application. The puzzle of the Internet, as the example of Amazon.com CEO Jeff Bezos illustrates, is not to understand what it does but how to use it for business success. Such ambiguity, when the application is identified at the point of use rather than the point of manufacture, is a defining characteristic of IT — even in the case of more targeted products. Remember when the now ubiquitous ATM first appeared? Some banks evaluated it as a more or less cost-efficient alternative to the counter clerk. Others realized it could herald a revolution in customer service — and the destruction of a traditional entry barrier (retail branches) for new competitors. Hence, believer CEOs canvas opinions about technology implications, encourage speculation, and absorb and reflect upon technology-driven changes to other industry sectors and businesses.

Contrast these efforts in learning with the action of our atheist CEO who agreed to attend the IT fair that his CIO had organized to demonstrate imaginative IT applications — but then went round making jokes about each showcase exhibit. The signaling was awful, and he learned nothing. Consider the hypocrite CEO who would eagerly talk for PR purposes about his organization's IT R&D unit, but never actually visited it — so when he talked about it he gave misleading impressions and, of course, never internalized any messages himself. Ponder the fate of the waverer CEO of a distribution business who approved a warehouse automation project without spending the time required to assess the risks. The project failed and his career ended. The lesson? Keeping abreast of new technologies is not just about envisioning new applications and possible implications; it means knowing which questions to ask about current initiatives and sensing when and how to ask them.

The principal reason for continuously learning about IT is that you can no longer be confident about analyzing threats and opportunities without such knowledge.

Forming a Vision of the Future

The principal reason for continuously learning about information technologies is that you can no longer be confident about analyzing future business threats and opportunities without such knowledge. As the Industrial Revolution gathered momentum in the eighteenth century, survivor mill owners and iron masters knew all too well that the next manufacturing technology or transport innovation could make or break their business. Says GE's Jack Welch, "The success of GE's high-growth plan to become a global service company which happens to make products is absolutely dependent on information technology."

Hence, believer CEOs invest in developing the vision of the future for both their industry and their business. They may do this through specific studies: General Robert McDermott at USAA brought in a team of consultants to promote the vision of a business offering a truly integrated service across a range of financial sector products; Browne at BP initiated visionary exercises that looked 25 years ahead to the year 2020 — "20/20 foresight not hindsight" was the catchphrase; Schou at Lån & Spar Bank sketched out five possible technology-enabled paths to the bank's vision 10 years into the future.

However, the vision requires continuous thought as technology (and competitive response) evolves. Even as Land Rover was completing the radical changes to product design, manufacturing design, and supply-chain management processes required for developing the Freelander, CEO Robertson was speculating on where technology would enable the next breakthrough in these three critical areas of performance. Once Shorko Films had realized the productivity benefits of installing a distributed process control system, CEO Christian de Pierrefeu looked for software tools to exploit the newly available factory floor data. He then sought to leverage the factory data with new process technologies. We see the same pattern at Amazon.com. CEO Bezos analyzed what sort of buying and selling would be made possible by the Internet. But since then he has continuously evaluated the potential of the Internet and Web technologies in order to leverage his first-mover advantage.

Of course technology is only one input to the vision. Analysis of industry trends, environmental forces, and organizational capabilities goes hand in hand. Believer CEOs seek to craft a robust and holistic vision which makes sense on all four parameters. Zealot CEOs usually lose that balance, becoming captivated and obsessed by a high-tech dream. When you hear phrases like "office of the future" or "factory of the future," you probably are encountering a vision based on technology in isolation. Monarch CEOs also isolate the technology input, but quite differently. They draw their future scenarios from analysis of the other three parameters. Technology, it is assumed, will be retrofitted; but it may be like adding wings to the transatlantic liner and often too late.

While atheists confidently deny any vision that is enabled by new technology, waverers and agnostics delay facing up to the implications. CEOs of now vanished Frontier Airlines and People Express famously ignored the transformation of industry distribution channels by rival airlines that had computerized their reservation systems. And just recently the CEO of a financial market was continuing to resist any economic or strategic analysis that predicted

Poorly conceived infrastructures can be a hazard to business operations and an impediment to business growth.

widespread electronic trading; he would only face up to an electronic market when there was no alternative, but again this was probably too late.

Sponsoring Internal and External IT Architectures

IT architecture, the conceptual design of the technological infrastructure of the business, can be anathema to senior executives. "Architecture" sounds like gobbledygook; it is embodied in standards whose currency and relevance arouse controversy and emotion; it can be positioned as an obstacle to innovation and rapid systems development. In short, it is a minefield for CEOs. Yet CEOs soon discover that poorly conceived infrastructures can be a hazard to business operations and an impediment to business growth.

Believer CEOs sponsor IT architecture in three ways:

• First, they engage in dialogue with technologists in IS and elsewhere to evaluate proposals and their implications for the business. Typically important questions include: Is there evidence that this combination of technologies will extend the necessary services to the target populations as the vision is adopted? Have the technologists established the robustness and the risks inherent in the architecture? Will rival technologies make any chosen components obsolete? Are we building an infrastructure we can afford?

• Second, they use the carrot of their vision and the stick of their authority to ensure architecture standards are respected across the business; usually this is confined to making just a few standards or policies sacrosanct.

• Third, they establish seed-corn funds — available at key stages — to implement important features ahead of proven benefits.

Thus, in the 1980s McDermott at USAA mandated a coherent corporate architecture across the product businesses to deliver integrated services, and Michael Jordan, CEO of Frito-Lay, sponsored the infrastructure that underpinned his company's leadership in managing information. More recently, Larsen has similarly sponsored global infrastructure to foster knowledge sharing among Johnson & Johnson's decentralized businesses, and Browne has personally championed BP's "common operating environment," which supports his own vision of knowledge sharing by providing full standardization at the desktop.

Today's business visions require sponsorship of external as well as internal IT architectures, defining how the infrastructure will provide linkage to suppliers, channels, customers and allies. Land Rover's Robertson is an example of a CEO who recognized that the business vision depended on an IT architecture that spanned the total supply chain; he led the effort to specify technical standards for suppliers during development and production. Jack Welch's vision for providing global service has resulted in an architecture that allows in-flight monitoring of GE's jet engines.

Naturally, zealot CEOs are even more interested than believers in architecture, confident that the best or latest technology will determine the business winner. For example, one public utility CEO, with the help of consultants, spent a fortune implementing rather unimaginative systems using the latest technology. Imposing apparently "top of the market" enterprise resource planning (ERP) systems are the latest manifestation of this trend. More surprisingly, we have seen monarch CEOs, for example, in a communications company, presiding uncomfortably over "bleeding edge" infrastructures. It seems that they often recruit and delegate to technology-centered CIOs who are obsessed by architecture; but, as implementation difficulties arise, the CEOs are unsure how to assess their initiatives.

Other nonbelievers also struggle with IT architecture; atheists and agnostics point out more or less vigorously that infrastructure investments do not bring benefits. "Keep it simple," "copy what so-and-so did," "just get it done" are phrases that dismiss architecture, but often return to haunt the company. Waverers are too preoccupied elsewhere to sponsor the enforcement of standards. Hypocrites, including CEOs we find all too often in the public sector, proclaim the importance of architecture but then standardize on equipment offered at "fire sale" prices. The equipment frequently turns out to be a technological dead end.

Embedding Information Management Processes

The positioning by believer CEOs of IT as a first-order factor of strategy making drives three critical aspects of information management within their organizations: the way IT strategies are *created;* the way potential IT investment is *evaluated and sanctioned;* and the way in which projects to implement approved investment plans are *set up and governed.* These are the three essential levers for putting the business into IT.

Whereas others typically expect IT strategy to emerge in response to business strategy, believer CEOs preside over a single integrated strategic development effort. Classically, the process involves a cross-business management team taking one or two components of the wider future vision of the business and thinking through how to achieve step-change performance improvements in those components. IT strategy then comprises the application and technology developments that have been identified as critical to fulfilling the business initiatives. For example, the use of immersive virtual reality technology became part of the IT strategy of Land Rover because it enabled the design of superior manufacturing processes and facilities in half the traditional time. In this way, the IT strategy becomes focused on the relatively small number of initiatives that represent great leverage for the business, to the increasing exclusion of many possible initiatives that are more peripheral. For example, faced with the threat of plant closure by the parent corporation, de Pierrefeu at Shorko Films halted all other IT projects until he implemented a process control environment.

Within such a mind-set of integrated business change initiatives, IT investment is evaluated as just one component of the total investment required to achieve the desired benefits. Once he became CEO for British Airways, Sir Colin Marshall insisted that only business directors could present cases for IT investment. He wanted them to "own" the related business idea, the targeted business benefits, and the wider business changes that must accompany the technology. The CIO was expected only to comment on technological issues. Such a business-oriented approach to IT evaluation is the second essential information management process.

Such business ownership is the hallmark of successful development projects and underpins the third process. Believer CEOs understand the need for multidisciplinary project teams incorporating the highest quality business staff as well as IT specialists; they insist that senior line management act as sponsors and champions. They increasingly "time-box" such projects, demanding achievement of the target business benefits within "impossibly short" time scales; their purpose is to focus the team on delivering the adequate solution quickly, avoiding the struggle towards a "full function" system over a time period usually three times as long. De Pierrefeu composed his project team of 50/50 business and IT people; he himself was the sponsor and his production director the champion. He broke the project into manageable stages — learning from one to the next — and set incentives for the business and the IT vendors to ensure they achieved benefits.

Several of our nonbeliever CEOs fail to embed these three critical information management processes in the organization. Monarchs tend to leave everything to the CIO and the IT function, and so it is fortuitous if widespread ownership of information management occurs. Zealots often take over these management and governance issues, but, by definition, limit organizational responsibilities. Agnostics, waverers, hypocrites, and atheists tend to give their assent to these ideas of treating IT management as seriously as, say, finance or marketing. But their lack of faith dilutes their will to implement. It is, however, salutary to note that several of the corporate IT disasters of recent times have occurred because at least one of these three basic processes was lacking — and, increasingly, it is the CEO who is fired before the CIO when this happens.

Challenging the Supply Side of IT

There is a tendency for IT departments to insulate their practices from challenge or criticism. Keen to advocate change in the rest of the business, they can be slow to change themselves. Because technologies, markets, and practices develop so quickly, insularity can be ill-advised. Believer CEOs do not let IT departments rest on their laurels. They challenge thinking on the supply side of IT — in particular, on sourcing and capabilities.

Indeed, Browne in some ways set out to break the mold of IT supply at BP. He famously pronounced in 1990 that "failure to outsource our commodity information technology will permanently impair the future competitiveness of our business." A radical and innovative IT outsourcing program followed.[6] In fact, this became part of a wider program of transformation, in which Browne set cross-challenges that led to wholesale restructuring, "reskilling," and repositioning of the IT function.[7]

Supply-side challenges need not be so grand, however. We have seen believer CEOs who demand radical improvement in certain dimensions of performance — for example, time-to-market on systems development, quality of service provision or help-desk responsiveness. However, what distinguishes such thrusts is usually a clear business rationale for improvement, and the setting of a "stretch" goal rather than the prescribing of the solution.

The converse behavior is typified by a zealot CEO who, when faced with financial downturn in his insurance business, outsourced all IT activities to reduce cost. He set the goal and determined the solution. Eighteeen months later when financial health was restored, he realized the error of his ways. "When I started to think about strategic renewal, I found all options needed IT capabilities and the ideas of my best IT people; unfortunately I had lost them all through outsourcing and I could not rebuild quickly enough," he admitted.

One atheist CEO was high on challenge because he was high on scepticism. Every year he asked the corporate IT department to justify its existence, but never explained why. The CIO responded with strategic audits. Eventually, the CIO resigned and took his team with him. The CEO would never have challenged the finance or marketing function in this way.

Becoming a Believer

Prospective CEOs may now be asking: "How do I become a believer?" Nonbeliever CEOs may be asking: "What is the road to conversion?" We have concluded from our studies that neither answer is difficult, except that some strange nostrums abound.

The first is that CEOs must be "IT-literate," usually meaning that they must be avid users of PCs, know ATM from PCM, and perhaps even be capable of developing their own personal information systems on a DIY basis. We see no evidence supporting this claim. Indeed, such technological competence could lead to zealotry. Conversely, some of our believers don't actually use technology very much. Believer CEOs need to be "IT-oriented," not "IT-literate." The second strange nostrum is that truly modern Information Age CEOs spent some of their earlier career in the IT function. To be sure, a few CEOs have experienced such career trajectories, but we know one who has been a success and another a failure! Believer CEOs are not "IT-experienced," they are "IT-savvy."

Confronting the Information Age future is equivalent to confronting your god. There is little escape.

Future CEOs

We see two paths to becoming "IT-oriented" and "IT-savvy." The first is demonstrated by how many of our believers have confronted the future of their industry and business. They have spent sustained time thinking about what the future could hold for their business (especially if they do nothing about it) by identifying key trends and analyzing the possible threats and opportunities. In the Information Age, this exercise is soon likely to bring a realization that IT is not marginal to the agenda, but central to it. Confronting the Information Age future is equivalent to confronting your god. There is little escape. This is one important route to becoming "IT-oriented." It worked for several of our believers — Grant, Schou, and McDermott among others. And it is probably starting to work for those CEOs confronting the future in a world of e-commerce.

The second path is having had real executive involvement in an IT project. It can teach you something about the potential of IT, it gives you experience of what is involved in delivering IT, it gives you confidence to be able to ask questions, and often it creates a network of people you can draw on. It worked for Marshall when he was involved in a crucial project at Avis before joining British Airways; it converted de Pierrefeu in an immediate way at Shorko; past project experience gave Robertson confidence at Land Rover. It is an effective means of becoming "IT-savvy."

Existing CEOs

If you already are a CEO, how can you become a believer? Nonbeliever CEOs rarely will have the luxury of experiential learning through deep involvement in a project. They can, however, confront the future — and this is probably an effective means of conversion for atheists, agnostics, and waverers; for confronting the future can change belief. Zealots, monarchs, and hypocrites require more of a behavioral change. Perhaps the best thing they can do is develop their potential successors by giving them IT experience and putting them on a future strategy exercise. For those nonbelievers who think they should and could change both their attitude and behavior, we recommend learning from others in three ways. One mechanism is to study a business in which IT has been part of a strategic success story and seek to learn not only what was done, but how it was managed. A second is to talk to and rub shoulders with believer CEOs — adopting role models if you like. A third is to engage with your firm's executive team in a collective education and development exercise in which confronting the industry's future, working out your firm's future, and starting to build it are the objectives.

The Bottom Line

Until recently, CEOs have been able to survive even if they avoided anything related to IT, leaving IT leadership to others. However, during the 1990s, when firms have made IT mistakes on a grand scale, the CEO often has been the first casualty. Being "IT-oriented" and "IT-savvy" — or, if you like, being "believers" — has become a critical survival factor for CEOs. In the next decade, when business strategy and achieving superior performance are essentially about knowing how to compete in the Information Age, there will be no room at all for nonbeliever CEOs. You'd better believe IT!

References

■ 1. M. Bensaou and M.J. Earl, "The Right Mindset for Managing Information Technology," *Harvard Business Review,* volume 76, September-October 1998, pp. 118-128.

■ 2. S.E. Prokesch, "Unleashing the Power of Learning: An Interview with British Petroleum's John Browne," *Harvard Business Review,* volume 75, September-October 1997, pp. 146-168.

■ 3. Ibid.

■ 4. Presentation at World Economic Forum, Davos, Switzerland, 30 January 1997.

■ 5. M.J. Earl and D.F. Feeny, "Is Your CIO Adding Value?" *Sloan Management Review,* volume 35, Spring 1994, pp. 11-20.

■ 6. See J. Cross, "IT Outsourcing: British Petroleum's Competitive Approach," *Harvard Business Review,* volume 73, May-June 1995, pp. 94-102.

■ 7. See J. Cross, M.J. Earl, and J.L. Sampler, "Transformation of the IT Function in British Petroleum," *MIS Quarterly,* volume 21, December 1997, pp. 401-423.

Reprint 4121

MIT