Outlook

The journal of high-performance business

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Special Edition

Breaking away

How to create value with information technology

Outlook

Outlook
Special Edition
May 2004
Outlook is published by Accenture

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Design & Production
Iridium Group Incorporated

www.accenture.com/Outlook

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Unleashing value from IT-driven innovation

Joe W. Forehand
Chairman & CEO
Accenture

Over the past few years, leaders have looked to innovation as a way to grow their companies out of the global downturn. Now that we see economic recovery in many parts of the world, innovation—especially in information technology—is becoming even more critical to growth and high performance.

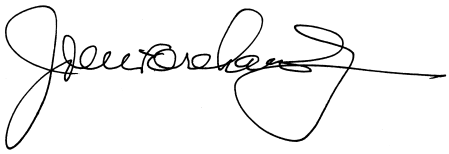
Clearly, IT is essential in an environment where demand for information is at an all-time high and where time is in short supply. And even though information is extraordinarily abundant, I have yet to meet a business executive who has all the information he or she actually needs or receives it in a timely manner. It seems that leaders today face a dual challenge: getting the right *I* in IT, amidst an avalanche of data; and knowing how to unleash the *T* to create value for our enterprises.

Sitting at the intersection of business and technology, Accenture has had a unique view of the shift in IT priorities. While CEOs and senior executives must always be mindful of simplifying, securing and rationalizing IT, we also find ourselves racing to seize competitive advantage and increased productivity through IT-driven innovations.

The exciting news, from Accenture's perspective, is that we believe the world is at the dawn of the next wave of technology innovations. We envision a convergence of web services, RFID, mobility, wireless and insight technologies—all coming together to take real-time decision making to powerful new levels, and transforming modern life as we know it. In practice, this means high-performance organizations will grow revenue by embedding technology in everyday products that enable a wide range of services—from maintenance services for cars, to status services for supply chains, to intelligent communications for the remote monitoring of heart implant devices, to name just a few examples.

Interestingly, as this wave of change breaks over business, we see a growing gap between the rate of technology innovation and people's understanding of—and ability to use—these new innovations to improve their business performance. This *Outlook Special Edition* explores the relationship between high performance and IT, and presents a three-step approach to getting the most value from technology innovations. The authors focus specifically on four interconnected facets that create business value: infrastructure, integration, industrialization and innovation. By working simultaneously to master these areas, organizations will be able to deploy information technology most effectively to deliver innovations and realize their fullest potential.

As leaders, we must continue to satisfy today's demands for cost-effective, secure IT while also sharpening our view of technology innovation to enable high performance and future success. I hope this reading provides some relevant insights for striking this balance, as well as inspiration for the exciting journey ahead.



Getting IT right

The English lexicographer and essayist Samuel Johnson once observed that "knowledge is of two kinds. We know a subject ourselves, or we know where we can find information upon it."

This succinct parsing of knowledge is still quite serviceable more than 200 years later. However, it's unlikely that even the learned Dr. Johnson could have imagined the abundance of information available today or the extraordinary array of technologies that help us find it, store it, share it and ultimately harness it to create business value.

The critical interplay of information, technology and value is the subject of this *Outlook Special Edition*, which is the outgrowth of more than six months of research at Accenture. The effort was undertaken at the behest of CEO Joe Forehand and Chief Strategy Officer Tim Breene; their objective was to determine which elements of technology actually drive business performance. Bob Suh, the Accenture managing partner responsible for strategy in the company's Technology, Alliances & Solutions group, was tapped to lead the project, which eventually would involve the contributions of an impressive roster of 30 technology experts from across the company.

Suh and his team interviewed dozens of CIOs as part of their research. "We knew it would be easy to criticize information technology after the equity market meltdown," he recalls. "We also knew that some companies were quietly making a big difference in their markets by leveraging IT. But it was difficult for these CIOs to quantify those results, and when earnings turned south, IT was an easy target." This dilemma, of course, went to the heart of his team's mandate to identify and document the contribution of technology to high-performance business.

As the work progressed and themes began to emerge, the team discussed its findings at several external venues in the United States, Europe and Asia, including the World Economic Forum, professional and industry conferences, and a classroom presentation at the MIT Sloan School of Management. Hypotheses were refined and messages were honed.

The end result is a bold and comprehensive new vision of how companies can use technology to create value by mastering four key aspects of IT: infrastructure, integration, industrialization and innovation.

"We were surprised to find how much potential value companies could derive from their existing investments in infrastructure," notes Suh. "But we were also concerned about the precarious situation at companies where the economic promise of IT was so close to being delivered, and yet the decision whether to continue or stop investing could go either way."

It's clear we've only scratched the surface when it comes to the ability of technology to drive better top- and bottom-line business value. But as Suh points out, "It takes discipline and hard work to get it right."

David Cudaback
Editor-in-Chief
david.cudaback@accenture.com

Breaking away

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Outlook Special Edition

Creating business value through

information technology

By James Hall and Bob Suh

The innovation that drives long-term value flourishes in the right information technology environment. Organizations that can master four key IT capabilities will achieve the combination of global flexibility and efficiency that is essential to high performance.

For any organization seeking to achieve high performance, the role of information technology has never been more vital. The extraordinary abundance and easy accessibility of information mean that its very nature is changing. The tools and technologies used today to gather and share information are contributing to an ever-expanding list of new uses for information, in both business and government. Meanwhile, increasingly advanced, cheaper computing power and data storage have simplified the management of this avalanche of words, numbers and images.

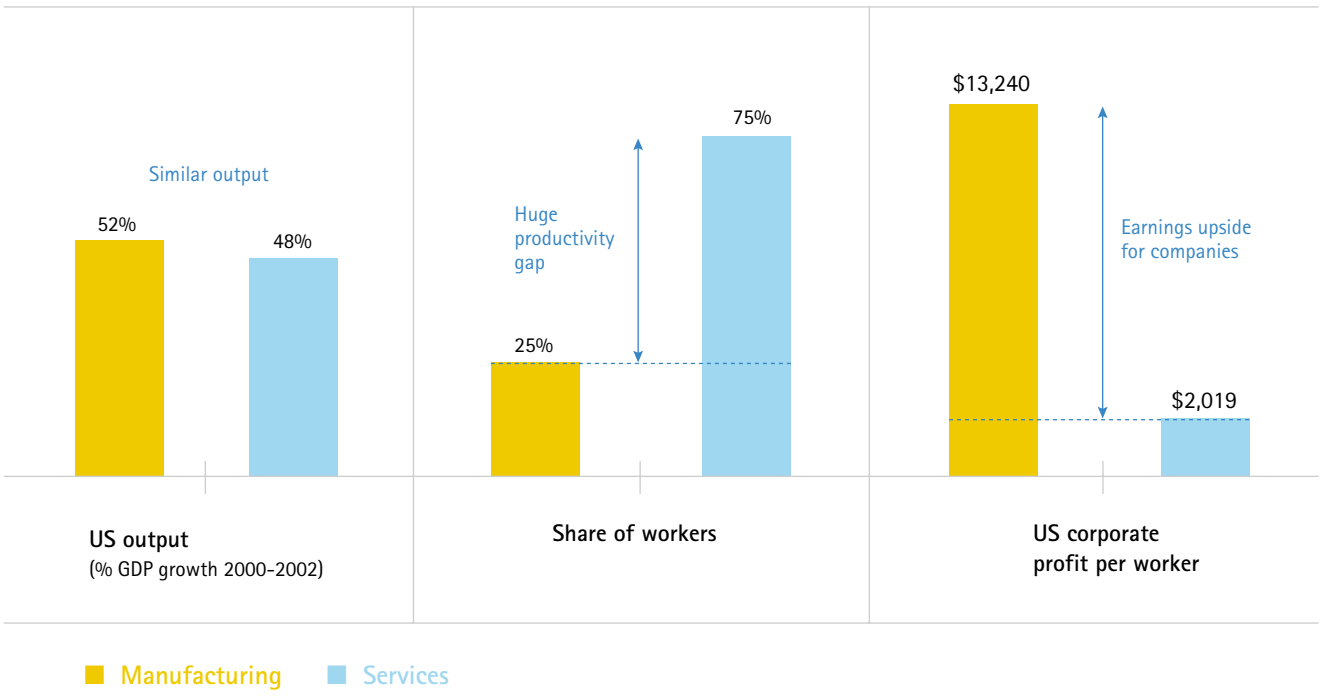
These forces have combined to give companies an unprecedented opportunity to use IT to create business value, the ultimate standard for measuring high performance. For most companies, this will involve three steps: reassessing their information technology plan and approaches; investing carefully to support their IT plan; and mastering the capabilities needed to realize that plan.

A high-performance IT plan involves managing far more than traditional business data derived from enterprise resource systems. Today, corporations also have access to information from real-world observations, made possible by the growing prevalence of RFID tags, sensors, web cameras and GPS, as well as information from shared data banks and the Internet. And, thanks to the advancement of wireless and mobile technologies that tap and share information, ubiquitous access is a near reality. This means information is coming from beyond the firewall, in quantities never before experienced.

Finally, an IT plan must accommodate the crucial need for speed. Business today operates at a frenetic pace, with transactions—and decisions—essentially being made in real time. The technology that makes information available to decision makers needs to be streamlined and flexible. This way, it can connect the many diverse participants in information sharing both inside and outside the organization, handle the demands of this new business environment, and be adaptable as conditions change and opportunities arise.

Closing the productivity gap

The manufacturing and services sectors of the US economy make roughly equal contributions to GDP growth, yet the difference in productivity is huge. This productivity gap is a business opportunity that companies aspiring to high performance can exploit by using technology to increase worker productivity through the more efficient and effective use of information.



SOURCE: US DEPARTMENT OF COMMERCE, INTERNATIONAL MONETARY FUND, ACCENTURE ANALYSIS

What is the business value of putting all this information to use more effectively, more rapidly and, above all, more strategically?

Consider the immediate opportunities for a major improvement in productivity, particularly in information-based industries. In the United States, the contribution to growth in gross domestic product was roughly equal for the manufacturing and service sectors from 2000 to 2002—yet information-based industries require nearly three times as many workers. As a result, annual corporate profit per worker averages about $13,000 in manufacturing but only about $2,000 in the service sector. That huge difference in productivity is a business opportunity that organizations can unlock by using technology to increase worker productivity through the more efficient sharing and use of information.

Companies seeking to become high performers should aspire to nothing less than their own information revolution. IT makes it possible to achieve in information-based industries what business has already achieved in manufacturing: the smooth and efficient delivery of products, created using standardized processes that incorporate the best and most efficient talent worldwide.

As organizations expand their information networks and integrate their hardware and software systems, it becomes possible to deploy work around the globe, broadly share expertise and perform as global teams. The combination of flexibility and efficiency achieved globally is a key element in high performance.

The short-term business potential is clear. Just as important, Accenture believes that information technology is the most fertile ground for innovation that can drive long-term value. As technology advances, it opens up new possibilities that innovative organizations will exploit for competitive advantage. In any industry, whether service or manufacturing, better products and services come through in-depth knowledge of the customer and through providing products rich in context—and, therefore, of real value to the user. This is equally true for governments.

Strategic investing

To capture the business value of information technology, organizations need to move beyond seeing IT narrowly as a function whose most important consideration is cost control. Instead, they should adopt a strategic approach to IT investments that are likely to yield better returns more quickly than in the past.

This is true, in part, because the technology itself is reaching a level of maturity that makes investment productive. And costs have come down as suppliers have cut prices; tools and methods for developing, integrating and maintaining systems have improved; and high-quality technology labor has become available globally.

Equally important, many companies have already sown the seeds for this revolution by putting into place much of the necessary infrastructure and capabilities, which they can build upon to achieve significant business value and competitive advantage for a relatively modest incremental investment. With the judicious consolidation of existing systems and well-planned investment decisions, an organization can be in prime position to take full advantage of information technology on a continuing basis.

This *Outlook Special Edition* will explore the relationship between high performance and information technology, with a special focus on the central skills to be mastered. It will look at the interrelated areas of *infrastructure* and *integration,* which together create the IT backbone. It will also look at the opportunities that come from taking a new approach to information technology management, one that is based on the principles of *industrialization,* with a focus on metrics to drive down cycle time, increase predictability, reduce rework and defects, and fully leverage global sourcing. And it will explore the role of information technology in delivering the *innovation* that fuels growth.

While each facet—infrastructure, integration, industrialization and innovation—will be discussed separately, they are clearly interconnected. Indeed, it is only in combination that they create value. By working simultaneously to master these four facets, organizations will be able to deploy information technology most effectively to deliver business value and achieve high performance. ■

Infrastructure

Consolidate, standardize, streamline

By Doug Kasamis and Stephen Nunn

A robust IT infrastructure, built on a master plan, can deliver real business value by enabling companies to optimize existing resources as well as accommodate new waves of technology.

IT infrastructure is the vital conduit for information in any organization. In business, a streamlined, standardized infrastructure is integral to the way applications, business processes and services are delivered. With emerging technology, it is possible to derive information from, and send information to, not just computers but a variety of mobile devices, including PDAs, wristwatches and automobiles. For all of these, a host of new capabilities will be enabled through the advancement of infrastructure technologies.

The technology infrastructure of a high-performance business must be able to handle enormous volumes of data from inside and outside the firewall. It must accommodate data from a range of new sources and in a variety of formats—numerical, text, voice, image. It must gather, store and transmit information dynamically to accommodate the fast-paced decision making required in a real-time world. And it must provide access to information securely, balancing protection against business need.

With all these changes as a backdrop—and with CIOs facing constant pressure to keep costs at bay—the challenge is to deliver these new capabilities without adding to the complexity and cost of existing infrastructure. Accenture believes that challenge can be met.

Delivering value through infrastructure

Some companies are moving aggressively to upgrade their IT infrastructures. Take Sainsbury's, one of the United Kingdom's largest grocery retailers.

In 2000, faced with fierce competition and declining operating profits, Sainsbury's embarked on a radical business transformation program to improve its stores and customer service, its supply chain and, above all, its IT infrastructure. As part of the program, the company sought to reduce the complexity and improve the effectiveness of its IT infrastructure—for both existing and new technologies.

In one of the largest replatforming programs undertaken in the retail world, Sainsbury's adopted a strategic view of its infrastructure. The program had two main aims: to deliver improved IT service; and to drive down the cost of operations, which would help the company realize immediate cost savings and support its move toward improved revenues and profits.

As a result, IT service levels have been improved dramatically while associated operating costs have been reduced through a program of standardization and consolidation across a range of hardware, database, communications and applications systems. The company's IT infrastructure, once described as "spaghetti-like," has been streamlined, producing significant cost savings: Sainsbury's target of a 50 percent reduction in costs over the seven-year program is well on track.

Improvements to the IT infrastructure have also underpinned Sainsbury's wholesale replatforming of its core marketing, trading, supply chain, retail, human resources and finance application systems. Today, the company is equipped with state-of-the-art, fully integrated retail application systems. In other words, a well-designed IT infrastructure has enabled innovation at the giant retailer.

A robust infrastructure can deliver real business value and outcomes. Sainsbury's experience illustrates how infrastructure investment can

pay off in improved operations and reduced costs. Emerging technologies promise to deliver even more benefits. Smart shelves that trigger their own restocking and repricing are just around the corner. And soon, customers may be able to access a wealth of information about any product from store-based kiosks or their own handheld shopping PDAs.

Infrastructure enhancement can also enable companies to optimize the use of existing resources. One company, for example, is investing in telematics for the large private rail fleet that transports its products. (For a related article, see "When products talk," *Outlook*, May 2003.) The solution involves the use of satellite communications; solar power; GPS; and weight, temperature and impact sensors. After seeing a prototype of the technology, this company launched its own tests, which revealed a much larger potential benefit through increased "turns" (journeys from the production facility to the customer and back) on its railcars.

Organizations that aim to become truly global need an infrastructure that will allow virtual management and smooth information sharing. A well-integrated infrastructure, for example, allows an organization to securely store and move data at will. Storage devices can be operated as nodes in a global network, in sites chosen for their economic benefit, security or promise of redundancy. Data can be tiered, with older, less frequently accessed data stored and managed differently than newer data that is part of the ongoing business process.

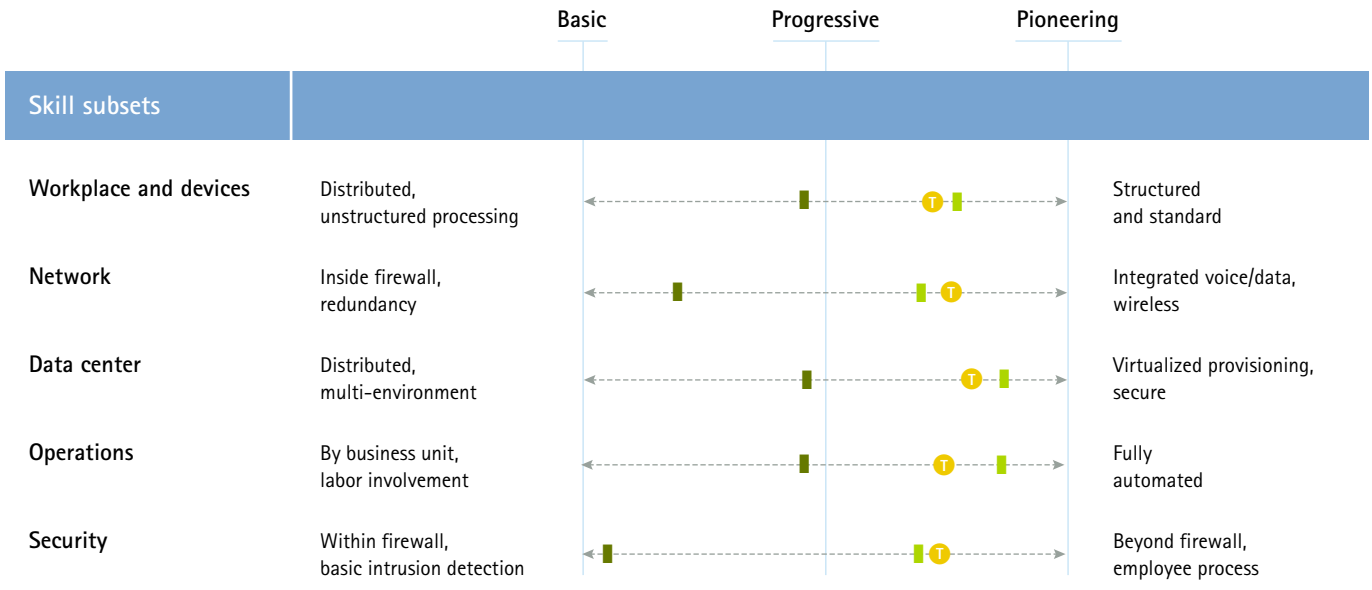
Global teamwork

An integrated global infrastructure supports global teams, which allows an organization to make the best use of valuable human resources. Projects can be segmented, for example, with different types of functions or operations performed in locations where the talent best meets the need. Or a valuable skill can be shared worldwide.

For example, the CIO of a global manufacturer had an excellent planning organization located in Europe; it was highly skilled at predicting inventory needs but was unable to leverage this talent worldwide. As a result, inventory performance was strong in Europe but too variable in

High-performance infrastructure

The successful use of information technology to achieve high performance is driven by the mastery of skills in four key areas of IT—infrastructure, integration, industrialization and innovation (see story). Accenture technologists have surveyed informally a number of large corporations to determine broadly their degree of mastery of these skills. The chart below breaks down infrastructure into skill subsets and assesses mastery on a rough scale, from "Basic" to "Pioneering." The symbol ▮ indicates the average level of mastery for each skill subset; ▮ indicates the highest level observed; Ⓣ indicates the state of readiness of commercially available IT tools to help companies achieve mastery in this area. (Charts tracking skills mastery in other aspects of IT appear in the sections that follow.)



SOURCE: ACCENTURE ANALYSIS

other regions. Today, the CIO is leading an IT infrastructure-enabled reorganization, in which resources, though scarce, are made available to the global organization.

Finally, an organization's IT infrastructure is the foundation on which it can build—often for a relatively modest investment—innovative new applications and functions.

One example currently under development at Accenture Technology Labs is for digital pen and paper technology. These pens work like ordinary writing instruments but are embedded with electronics that store and time-stamp data, which can be transmitted via the Internet to a central server for further processing, storage and analysis. In the right situation, digital pen and paper technology could be a low-cost alternative to equipping legions of employees with portable computers or PDAs, then training them in a new system. The pen offers enormous potential productivity gains in any paper-intensive industry—provided, of course, that the organization has the infrastructure needed to download the data.

The reality is that most companies' existing IT infrastructures are not up to the task of supporting high-performance business and delivering value through technology. They are not yet virtualized, standardized or optimized. They are neither flexible and dynamically scalable nor fully automated. And they do not enable information to be readily shared.

In recent years, most IT infrastructures have evolved and grown in a haphazard, piecemeal fashion—either through systems included in mergers and acquisitions or in response to the needs of a specific business unit—rather than as the result of the careful execution of a comprehensive infrastructure strategy. These infrastructures are complex and tend to be underutilized, poorly integrated, inflexible and very expensive to maintain.

Economic considerations have, of course, contributed to the current costly, hard-to-manage state of many IT operations. When budgets are cut, infrastructure is often the first target. Rather than introduce new technologies that could have boosted productivity and created value, many companies have been forced to maintain their existing infrastructures through a series of patches and quick fixes.

As financial pressures ease in a recovering economy, companies can consider strategic IT investments. These should take into account the full portfolio of information technology needs, not simply infrastructure.

Moving toward mastery

Mastering core skills and competencies is an essential component of high-performance information technology. What does it mean to achieve mastery in IT infrastructure? Specific requirements vary by industry, but two are clear markers in all situations.

Build to a master plan

In the same way a builder needs a blueprint to construct a house, an organization should have a master plan when it sets out to build an IT infrastructure that will meet its strategic needs over multiple financial periods. The master plan identifies the series of small, business-driven initiatives required to achieve the overall transformation results, and it provides the necessary information to support the long-term financial business case.

A strong master plan enables managers to resist pressure from individual departments or business units to

include ad hoc components to meet their special IT requirements. In this way, it can save money by avoiding the waste of building something that may not fit together over the long term and that, as a result, may even have to be scrapped.

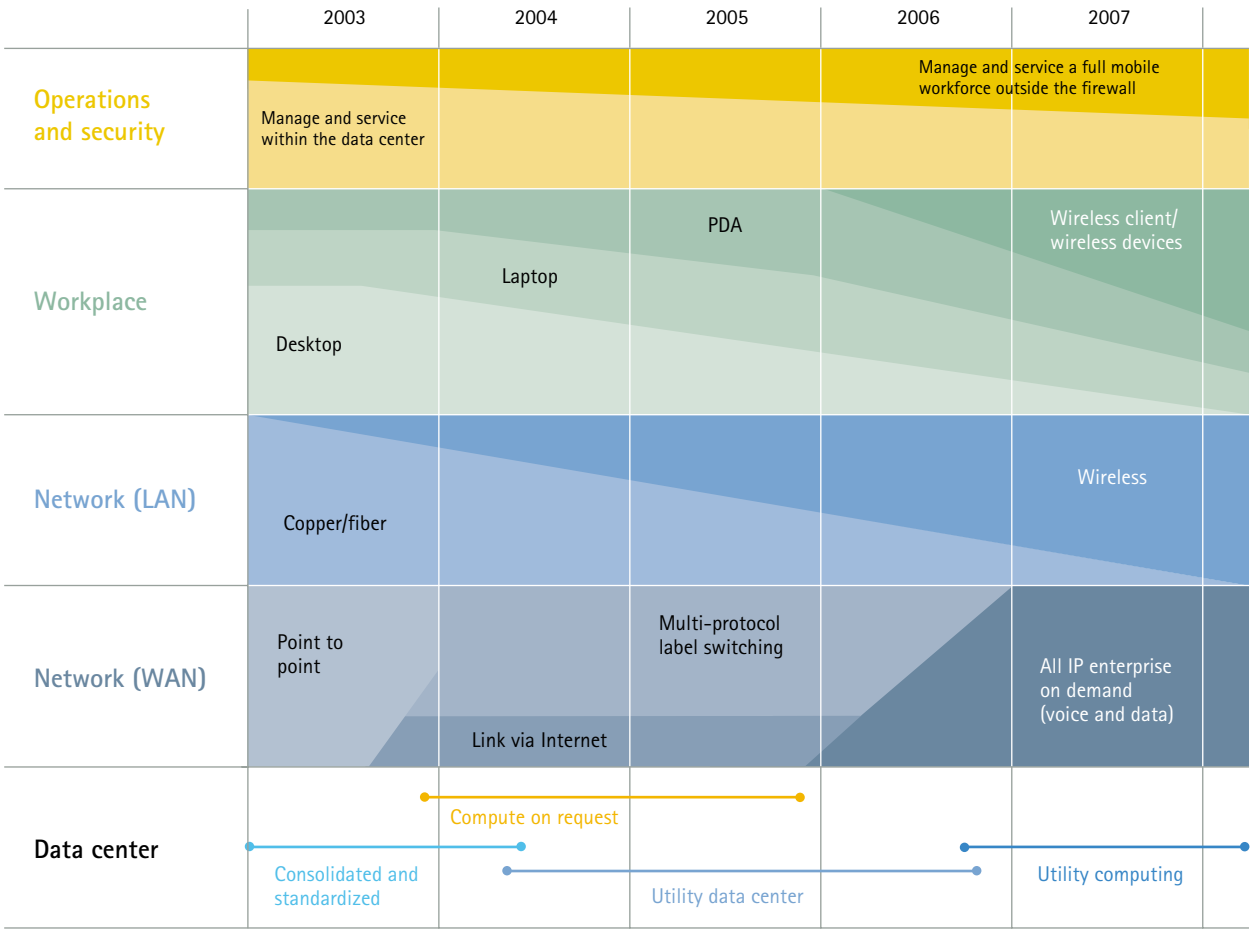
The master plan also helps ensure that the organization will function well as a whole. Access to the infrastructure's systems should be as simple as plugging in a laptop—anywhere in the world. Information should be universally available and continually updated. Maintenance should be minimal and possible to perform even from half a world away. Ideally, the infrastructure should be so functional, reliable and easy to use that it is almost taken for granted.

Finally, a master plan can ensure that the organization's security policies are enacted through controls embedded in the IT infrastructure.

Prepare for new waves of technology
A master plan can also help organizations better understand how and when to invest in new technologies that extend their IT infrastructures. The growing list of new technologies includes Internet protocol convergence and voice-over Internet protocol technology; storage area networks;

High-performance infrastructure: Waves of the future

The chart below shows adoption rates of those technologies that will enable the high-performance business in the near future (see story). For example, over the next three to four years, IT operations and security functions will move gradually outside the corporate firewall, where they will be managed and serviced by a fully mobile workforce. And whereas today the majority of workers rely on the desktop for workplace productivity, they will rely increasingly on a mix of laptops, PDAs and wireless devices. Similarly, local-area networks will evolve from hardwired to wireless LANs to support a more mobile workforce, while wide-area networks will move from fixed point to point to all Internet protocol-enabled voice and data WANs. Finally, the data center will shift to a utility computing model that will feature an on-request capability for the provisioning of IT infrastructure.



SOURCE: ACCENTURE ANALYSIS

Dynamic provisioning holds the promise of greater system flexibility and performance at a much lower cost.

new security solutions to protect the extended enterprise beyond the firewall; virtualization of the data center; and utility computing.

For example, although not yet generally available, significant elements of utility computing are not far away. When utility computing arrives, companies will be able to procure IT services much as they do electricity or other utilities. They will be able to tap into the particular infrastructure components and resources they need to manage the peaks and valleys of business demand. They will buy what they need, when and where they need it, choosing from a variety of sources and paying only for what they actually use.

How far away is utility computing? Predictive operations (the ability to address problems, such as capacity overloads, before they happen) and virtualization of the data center (the ability to monitor, control, load-balance and fix remote infrastructure components) are good examples of early elements of utility computing that are available today. Accenture estimates that it will be another three to five years, however, before organizations will be able to fully leverage the opportunity for dynamic provisioning both inside and outside the firewall.

The dynamic provisioning inherent in utility computing fundamentally changes the economics of IT infrastructure. As the cost of basic services becomes variable rather than fixed, infrastructure becomes less of a cost to be controlled and more of an asset that, properly managed, can be the foundation on which business value is built. Dynamic provisioning holds the promise of greater system flexibility and performance at a much lower cost. These cost savings, in turn, will enable companies to fund new IT initiatives that will lead to new business capabilities.

Utility computing, however, is not a shrink-wrapped product that an organization can pick up off the shelf. Nor can companies afford to wait until dynamic provisioning becomes pervasive to reap the benefits. Achieving mastery in IT infrastructure requires an organization to move aggressively toward utility computing in three phases.

Phase 1: Consolidate and standardize
The immediate priority in most organizations will be standardization and consolidation. By minimizing investment in redundant systems and in the resources to keep them operating, an organization reduces the cost of basic IT services. The savings are immediate and can be reinvested creatively.

Consolidation and standardization also save money in the longer term. They enable systems to be changed—new infrastructure added, for example—in remote locations or worldwide without costly field trips by support personnel to manage the installation and transition. In essence, change becomes possible with the flip of a centrally located switch.

Finally, consolidation and standardization are essential conditions for a utility computing environment. The flexibility that comes from utility-style procurement of IT services is feasible only when infrastructure is streamlined; that way, the need for services can be readily met in a variety of ways, from within the organization and from outside suppliers.

Leading organizations have already embarked on this first phase—and are already realizing the immediate economic benefits.

For example, over an 18-month period, a large telecommunications company consolidated and standardized its entire global IT enterprise—from the workplace to the underlying network, including data, applications and servers. The effort generated significant cost savings and reduced annual IT expenses by 40 percent—savings that would have been impossible to achieve without some up-front investment. Perhaps more important, consolidation allowed the company to move into the second phase of its infrastructure transformation program.

A large financial services company offers another example. The company, which had been operating on a country-based franchise model, standardized, consolidated and built out a central infrastructure services organization with its own P&L responsibility—and realized savings of nearly 20 percent. With these processes and management functions now in place, the central infrastructure services organization is moving toward a utility-style computing model.

Phase 2: Achieve "pay-per-use" IT delivery inside the firewall
With its infrastructure consolidated and rationalized, an organization can begin the internal migration to utility computing. Widely available virtualizing software can be layered on top of existing systems, allowing the organization to establish its IT requirements in a far more dynamic way. Server and storage environments that took days to provision can now be set up in a matter of minutes.

In this new environment, the management of data and servers moves from silos to a more centralized function. Dynamic provisioning, combined with centralized monitoring, allows the organization to adopt a metering approach, charging back costs to the business units inside the firewall based on the services they use. This phase is about creating the underlying processes and organizational structures to support a pay-per-use model of infrastructure services.

Phase 3: Complete the move to a dynamically provisioned infrastructure
Once these internal processes are in place, the third phase of the transformation will evolve naturally. Organizations will be able to tap into computing, storage and networking services from a variety of sources, inside and outside the firewall, and pay only for the type and quantity of services or resources they use.

Reaching this state requires a journey of many months and a master plan that clearly lays out the path. With the emergence of utility computing likely within three to five years, organizations that do not begin the journey very soon are at risk of being left behind, at a competitive disadvantage to those that recognize and master the possibilities inherent in IT infrastructure. ■

Integration

Beyond data and applications

By Jon Hill, David E. Plesko and Anthony Roby

Companies that master the seamless merger of information from diverse sources will achieve a higher level of process performance, operate on the basis of better insight and intelligence, and be well equipped to exploit new business possibilities.

Imagine beginning your day by looking at an economic weather report—an online graphic representation of the global business environment, organized by region and based on continuously updated external information, including stock and commodity market reports, foreign exchange and interest rate fluctuations, trade and employment data, even geopolitical threat levels.

Further imagine that your company or division could overlay onto the screen all information from your internal and external systems that was relevant to your daily decision making—including, depending on your business, information such as the location of the fleets that distribute your products, or the current status of business assets like hotel occupancy or daily oil production.

In other words, imagine basing your decisions on a visual representation of real-time, global reality.

New business possibilities

For many companies, that fictional online report would be a gold standard for information integration—the seamless merger of data from diverse streams, which include not only an enterprise's internal systems but also external feeds such as marketplace information and visual and numeric data from sources such as RFID tags, sensors and web cams.

Today, this level of information integration exists only in pockets within organizations, or in laboratory prototypes. But it is coming. And companies that master integration will achieve a higher level of process performance and operate on the basis of better insight and intelligence.

These companies will be able to do much more than share data efficiently. They will be able to measure business performance in real time through a fully transparent view—down to the slightest detail—of their business processes and customer data. With this information in hand, decision makers will not only be able to run the current business better, they will also be well equipped to envision new business possibilities.

Some companies are already well along the road to successfully integrating streams of business data. Delta Air Lines, for example, understands that every flight delay causes a ripple effect that has an impact on flights and customers around the world. The company created its "Delta Nervous System" to focus not on which systems had to be connected but on what could be done to solve the ripple-effect problem. As a result, the airline, using 70 applications, has integrated data across 13 business units, 30 customer databases and 40 flight databases.

Now, when a flight is delayed, information on its status cascades through the system. Departure times for connecting flights are readjusted, or passengers are booked on other flights. Baggage handlers learn which bags need priority treatment. Customers can learn their flight's status in real time at self-service kiosks or via messages transmitted to their wireless PDA or mobile phone. Soon the Delta Nervous System may be accessible through the Internet to customers, employees and business partners.

Reality check

Although most executives have heard exciting stories like these, their concerns are more basic. Haven't they already made major investments to integrate their systems? Why aren't they getting more benefits now?

To understand the difficulty in achieving more complete information integration, it helps to lay out what that would mean for today's complex organizations.

- Integration within organizational boundaries means linking all business unit data and enterprise application data to better leverage that information. Many companies still have islands of applications, stranded after a merger or reorganization, that need to be incorporated.

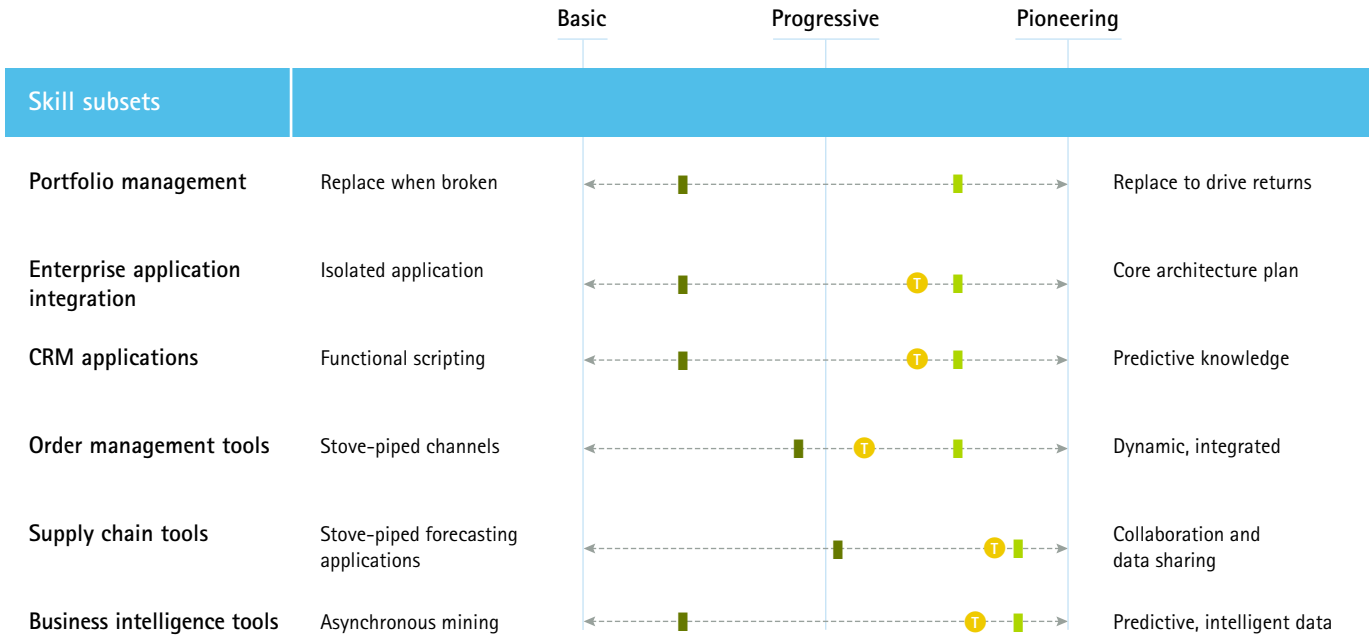
- Because almost no organization today is self-contained, operating in today's business environment also requires business-to-business integration of information and collaborative business process. This, in turn, requires not only the integration of applications, systems and processes but also the development of a standard platform on which all can be built to enable interoperability. This allows information from various sources in various formats to fit together easily.

- Finally, there is real value in integrating the strategic design and business processes used for building and testing applications. Without this level of integration, any future changes to applications would take considerable time and effort, because of the difficulty of modifying the underlying codes and processes.

Given this level of complexity and difficulty, it is not surprising that

High-performance integration

The chart below breaks down integration into skill subsets and assesses mastery on a rough scale, from "Basic" to "Pioneering." The symbol ▮ indicates the average level of mastery for each skill subset; ▮ indicates the highest level observed; Ⓣ indicates the state of readiness of commercially available IT tools to help companies achieve mastery in this area.



SOURCE: ACCENTURE ANALYSIS

Web services make it possible to fundamentally change the way work is defined and carried out within applications.

only 57 percent of respondents to an Accenture survey report that their companies have integrated all or most of their own enterprise solutions; 19 percent report they have barely started the process. Integration outside the firewall is even rarer. Substantial numbers of organizations report that they do little or no data sharing with customers (71 percent) or with suppliers (75 percent).

Even as many organizations work on basic integration within their own enterprise systems, the bar is being raised. Systemwide integration—including the company's suppliers and trading partners—will soon be a competitive requirement, and it already is an essential component of innovative solutions that ultimately contribute to high performance.

The good news? Most organizations, despite their discouraging self-assessments, have made a meaningful start. And new technology advances are making integration more achievable. Significant benefits from integration are now within reach.

Interchangeable data

So what has happened to make integration more achievable now? Primarily the adoption of web services, which allow organizations to assemble isolated application functions into more complete business solutions.

Despite the name, web services aren't services but an evolving set of industry-determined technical standards that enable applications to be integrated and systems to communicate. With the addition of certain software components, it is already possible to integrate diverse data streams. Web services enable faster and less expensive enterprise application integration, the wrapping of existing systems for reuse and application restructuring, and distributed computing. (For a related article, see "How web services will redefine the service economy," *Outlook*, July 2002.)

Web services enable data to be interchanged among all players in an industry, and several efforts are under way to develop such standards for the IT, electronics, semiconductor, telecommunications and chemicals industries. The Web Services-Interoperability Organization, for example, is an open industry group chartered to promote web services interoperability across platforms, applications and programming languages, and it is making good progress on this front.

Even more important, web services make it possible to fundamentally change the way work is defined and carried out within applications. IT specialists have known for years that linking one piece of data to another through lines of code is cumbersome, and that changes are difficult to make without extensive reworking.

Service-oriented architectures (SOAs) help address this problem by allowing specific tasks or services (generating an invoice, for example) to be handled as independent units and assembled and disassembled at will. Web services make it easier to implement SOAs by providing a standardized, easy interface between legacy systems and new systems, and between existing systems such as SAP, Siebel and Oracle.

SOAs have changed the way systems are developed. Since they are focused on business processes, they foster a closer working relationship between the technical and business

sides of an organization and force both to think clearly about how best to carry out business operations. They also allow applications to function as modules, to be mixed and matched, recombined and reused as needed, which reduces development costs. The growth of web services will continue and even accelerate this trend.

One-two punch

The one-two technology punch of web services and SOAs, combined with an integrated framework that rationalizes processes and centralizes applications, enable powerful business possibilities.

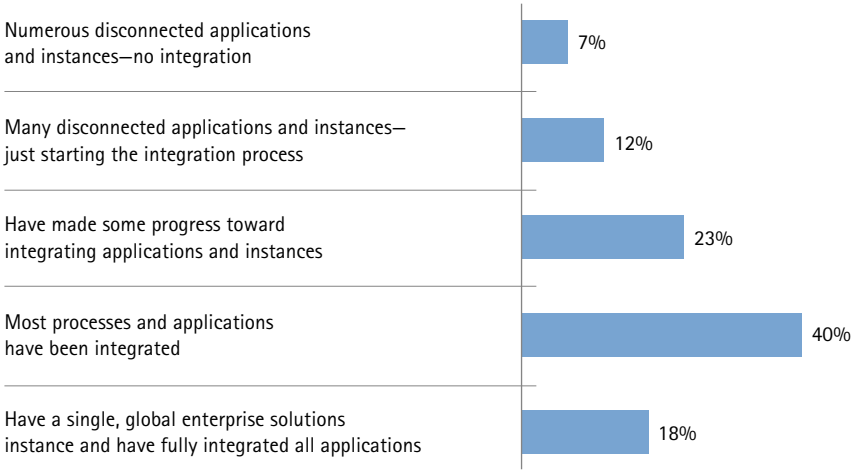
For example, Generalitat de Catalunya, the governing body for Catalonia, an autonomous region of Spain, implemented an SOA and used web services to establish an innovative, intentions-based portal that allows citizens and businesses to access government services. This approach made the services supported by 50 back-office applications interoperable, connecting standard enterprise systems, custom systems, legacy systems and niche technologies.

One service, for example, makes it possible to record a citizen's change of address through a single procedure that automatically ripples through to all relevant regional and municipal government entities. SOAs and web services also enable a log-in service by which any portal can authenticate any one of more than 6 million potential users,

An unfulfilled promise

Enterprise solutions were built on the value proposition of integration—linking all business unit and enterprise application data to better leverage that information. But given integration's inherent complexity and difficulty, it is not surprising that only 57 percent of respondents to an Accenture survey report that their companies have integrated all or most of their own enterprise solutions; 19 percent report they have barely started the process.

Integration of enterprise solutions



SOURCE: ACCENTURE ANALYSIS

giving them easy access to existing services as well as new features.

A human solution

Service-oriented architectures, web services and standards can help provide technical solutions to integration challenges. The remaining challenges have a human face: They involve how people work with one another.

Too often, the way an IT organization is structured has contributed to the formation of silos, with different individuals responsible for providing different applications, such as SAP or Siebel. Pockets of expertise and repositories of knowledge have developed in isolation from one another.

Furthermore, the IT organization does not often work closely with the business side. As a result, IT experts are not challenged to think broadly about larger business goals or solutions to companywide needs, and integration efforts are driven by technology experts who may not understand the business processes and their limitations as well as the actual business users do.

Striving for integration mastery requires a human solution as well as a technology solution. This starts with a basic rethinking of the way information technology supports the underlying business processes. Business objectives must drive the definition of business processes, technology architecture and staff capabilities. Bolting technology onto "the way we do things now" is a huge mistake. The first and fundamental question is, "What needs to be done—and how?"

Then solutions need to be developed across those traditional boundaries that create silos. The technical experts responsible for business intelligence, analytical data, integration and portals need to work in tandem with those from the business side, who should be project champions.

The attitudes that sustain silos are not easy to break down. But they can be overcome through a comprehensive integration process that brings people together as work processes are defined and solutions developed, and that holds individuals responsible for the overall success of integration efforts.

One example is a large utility company in the United States. It is embarking on a wide-ranging, four-year integration project to enhance customer service and field force management capabilities. As part of this project, the company reorganized its teams according to business processes instead of by application, as it had done traditionally. The effect was greater awareness of cross-team dependencies early in the project, which resulted in better resolution of integration challenges at the business process level.

Changing the way people work and think is often harder than changing systems or bringing in new technology. But organizations that are mature enough to strive for mastery are ready to accept the necessity of that change.

Integration in action

While no company yet has achieved a gold standard level of integration and interoperability, leading companies are overcoming the obstacles to integration. And for their efforts, they are realizing real economic value and business benefits.

When Paris-based Carrefour, the world's second largest retailer, adopted a vision that included

building a global company and optimizing resources and technology across geography, it needed to ensure its systems were consistent across the entire organization. The company designed, built, deployed and installed a fully integrated financial system to support effective accounting and financial activities.

Local teams were involved in each step of the design and implementation process. This made sure that the solution addressed local needs and was being used in a consistent manner throughout the organization. The infrastructure can support rapid expansion, making it possible for Carrefour to add new stores with the flip of a switch.

For computer maker Dell, supplier-management processes had typically relied on manual mechanisms, which limited the company's ability to scale its global business, maintain an optimal balance between supply and demand, and react quickly to marketplace changes. So Dell customized, integrated and implemented a supply chain management solution that gave the company visibility across its business system. It was now able to move closer to real-time order fulfillment by simultaneously evaluating supply concerns, factory capacity, shipping constraints and the specific requirements of each customer order.

Pirelli, a leading global manufacturer of automobile tires, cables and systems, was able to drive down costs and increase market share through integration. The company implemented more strategic processes that enabled business-to-business capabilities and integrated its systems with those of its global customers and dealers. It also was able to extend information and services to its customers and trading partners and reduce administrative activities.

Fully integrated and interoperable systems, along with a robust infrastructure, form the backbone that enables IT to deliver value. Most organizations already have much of this backbone in place. Stretching a bit more to take full advantage of IT's potential will have real payback. ■

Industrialization

Going global

By Keith Haviland and Basilio Rueda

A new approach to IT management focuses on driving down cycle time, increasing predictability, reducing rework and defects, and fully leveraging global sourcing.

From cars to CD players, toys to tennis shoes, we all take today's manufactured goods—inexpensive, consistent in quality, available in abundance—largely for granted. Rarely, if ever, does it occur to us that the success of manufacturing rests on a two-stage industrial transformation spanning more than two centuries.

Manufacturing moved first from the craft shop to the factory floor, where products were created to standardized specifications, in greater number and at lower cost. More recently, manufacturing became a global endeavor as the complete process was segmented into stages that could be carried out wherever it was most geographically advantageous.

The same basic phenomena are currently transforming information technology. Until recently, IT solutions have been "built at home," within geographic boundaries, often within corporate firewalls. Today, however, organizations have an opportunity to standardize IT work processes, segment the work and disperse work globally for greatest efficiency—in short, to industrialize information technology.

Mastering this approach will result in efficiencies that go well beyond simple cost cutting, enabling IT to generate savings that can be reinvested in technology. Rather than being a function whose costs need to be managed, information technology can take on a broader role as a force for value creation.

Application and process delivery

Let's look more closely at the idea of industrialization in the context of IT. It means much more than what is traditionally called "outsourcing" or "going offshore." Without doubt, many organizations have achieved real benefit from turning over basic business processes and IT to outside providers. Likewise, many organizations have found it advantageous to send IT work to low-labor-cost countries such as India, the Philippines or China. But the industrialization of IT is a broader, longer-term concept that goes beyond outsourcing or subcontracting work offshore.

The industrialization of IT rests on three pillars that parallel those underlying the success of modern manufacturing. Each signifies a fundamentally new approach to application and process delivery, and each is a component that high-performance businesses need to master.

1. Work processes are replicable and measurable
Industrialized manufacturing is based on processes that can be repeated to produce goods of reliably high quality again and again. Of course there is room for variation and customization, but the goods must ultimately conform to a proven and standardized model.

Yet in technology, development projects have long been treated as one-off creative endeavors. Now, though, information technology can benefit from reusable application and technical architectures. Tools are being developed to essentially automate much of the delivery process. Delivery processes and methodologies are being codified so they are repeatable. These changes greatly increase productivity.

And productivity can continue to improve, because rigorous metrics capture real, quantitative feedback across multiple projects. By learning what works best and where improvement is possible, an organization can continuously enhance its processes and tools as they mature. Productivity, quality and speed can all improve over time.

2. Work is performed by capable, technology-connected teams
In an automobile manufacturing plant, no one individual builds the entire vehicle. Work is segmented so that various parts of the assembly process are performed by those with the right specialized skills, up and down the line.

The parallel concept in information technology is the development of different groups of people with deep skills in technology, business processes and project management, who collaborate as a team. Technology helps team members to communicate seamlessly, even when they are not working side by side, and to develop a strong common corporate culture and set of values so that they are all committed to delivering a high-quality, technology-based business solution.

3. Work is located wherever it's most efficiently performed
In manufacturing, work was first concentrated in factories. Then, as products became easier to transport by rail, truck and air, portions of the business were relocated around the country, then around the globe.

Much the same is happening in technology, with one key difference: The product here is not a tangible object like a shoe or a car—it is information itself. Technology delivery centers, like factories, bring together individuals with shared responsibilities or skill sets. But these individuals are networked

through technology and communications channels like the Internet, which enables easy knowledge transfer and the rapid movement of information around the globe.

That smooth global flow of information means work can be strategically and economically segmented and dispersed geographically, for scale and flexibility. Having delivery centers around the world offers a number of clear benefits. One is security based on redundancy, which lowers the risk that disruption of any one center from external events such as political turmoil or natural catastrophe will affect the entire company.

Another benefit is speed: Work can be handed off as the sun sets; round-the-clock activity shortens the delivery cycle. Finally, each set of responsibilities can be carried out wherever it is best performed for strategic or economic reasons.

Work transformation

Adopting this strategy for the design and delivery of technology solutions means more than simply transferring work outside the central IT organization (whether this is across town or halfway around the globe). Skill centers and multiple locations are just components of a new overall approach to applications development and maintenance.

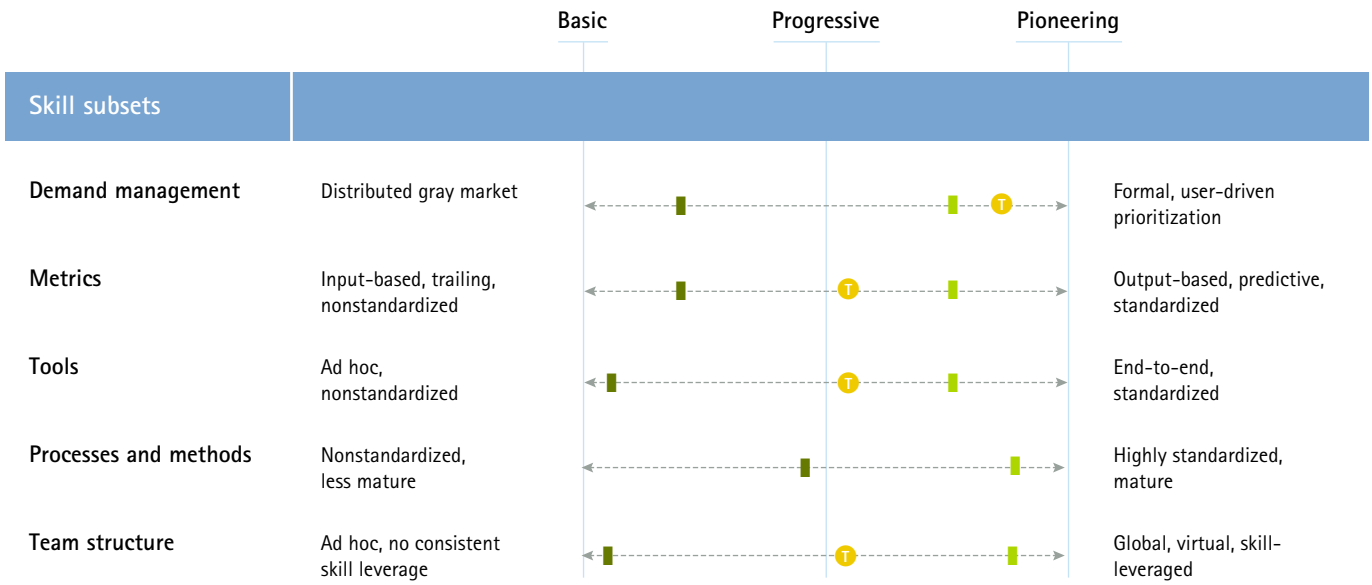
There are a number of ways this approach transforms how work is done.

It matches teams and experience to the complexity of the project and work.

Chief information officers often complain that their best resources are tied up in lower-value projects. This happens because resources often trade in a kind of gray market, where assignments are made in office corridors, usually based on personal, often geographically focused, relationships. This means that the best resources are not always matched to the most complex and potentially most profitable projects. The CIO of a major North American retailer, for example, discovered that his head of supply chain systems would often keep the best talent occupied with basic maintenance work until a large project was approved.

High-performance industrialization

The chart below breaks down industrialization into skill subsets and assesses mastery on a rough scale, from "Basic" to "Pioneering." The symbol ▮ indicates the average level of mastery for each skill subset; ▮ indicates the highest level observed; Ⓣ indicates the state of readiness of commercially available IT tools to help companies achieve mastery in this area.



SOURCE: ACCENTURE ANALYSIS

It optimizes scarce business and technical skills across geographies, service providers and departments. As companies embrace the discipline of industrialization, tapping into the best experts in the company and across service providers will be vital to ensuring consistently high performance. The best architects and designers will produce the best designs, which will lessen the need for integration and rework. If those architects and designers are available to all the delivery teams, they will ultimately benefit the majority of a company's projects.

Executives at a major global manufacturer of appliances, for example, noticed that the company had maintained a strong skill base in its Brazilian forecasting unit. As a result, the unit had consistently exceeded corporate inventory turn targets. Currently, the global CIO team is determining how to set up a global delivery model to take advantage of this unit worldwide.

Moving knowledge

Even though information can shoot around the world instantaneously, the process of transferring knowledge among human teams, and keeping information current for all users, continues to be a challenge. This hurdle, with its potential for high costs and process breakdowns, daunts many organizations. But technology can help.

Transferring knowledge work offshore, for example, has meant that key people have to come to company headquarters for extensive training. A typical four-month transition can cost $25,000 to $40,000 per person in international travel and extended stays, as well as in related issues associated with visas, family separation and more. Much of this transition period is taken up by knowledge transfer.

Can the necessary knowledge be exchanged without so much direct personal interaction? Accenture believes so. We have developed an approach that can transfer knowledge across multiple locations. Called the Accenture Rapid Transition Suite, it allows users in multiple locations to exchange information and retrieve knowledge whether working concurrently or in round-the-clock shifts.

Knowledge is captured in context and organized logically, and the status of knowledge transfer is continuously plotted for individuals and groups. Apprentices can be half a world away yet coming up to speed in a fast-paced but orderly way.

The Accenture Rapid Transition Suite is an example of one of the pillars of an industrialized approach: the value of replicable processes and repeatable tools. Before, Accenture client teams were creating knowledge-transfer plans from scratch every time a new project was initiated. By creating a methodology by which teams could ensure a successful transition in each necessary instance, Accenture has infused rigor and discipline into the transition process, reducing risk and cost while improving quality of outcome—and building team rapport.

Large teams on complex projects face another problem, too, especially when they are geographically dispersed. Teams are dealing with enormous volumes of data. That makes gathering knowledge about a specific business application time-consuming and costly, especially when the application includes legacy components, when multiple teams have worked on the application, or when a previous application development team is no longer in place.

Accenture Technology Labs has developed a Repository Navigation Tool that works with information in the formats that people actually use with text documents and spreadsheets, for example, rather than formal design templates and software code. The tool identifies documents with common threads, then splits the documents into meaningful pieces that can be categorized for future reference and use. This means that finding a relevant set of documents can take seconds instead of hours, and that the search will be of higher quality, because all relevant documents will be found. And when any document is changed, all related documents are automatically updated.

It builds and supports high-performance teams that can work together virtually.
Turning ad hoc, geographically focused teams into high-performing, global teams is critical to industrialization, since this is the basis for leveraging scarce skills and tapping into companywide resources. But companies should not underestimate the effort required to achieve this transformation. To execute global delivery of the best IT solutions, an organization's documentation, methods and processes, and tools all must be consistent, integrated and standardized.

It leverages the best tools available to eliminate repetitive and error-prone work activities.
Emerging software tools promise to do for information technology what robotics has done for manufacturing. Requirements and design tools not only help clarify what an IT system should do to support business processes, but also lay the foundation for consistent documentation and methods to be followed by everyone who works on the application.

Transition and collaboration tools help teams coordinate their work across geographies and time zones, and ease the transfer of work from one individual to the next. Project management tools track work activity and resource utilization against major tasks and milestones. In aggregate, these tools reduce the amount of low-value, redundant work.

It develops advanced manufacturing-style metrics that focus on cycle time and the elimination of rework and low-value work.
Most metrics available to CIOs focus on the cost of inputs, with little measurement of the outputs or results. Labor costs per day, for example, are much more readily available than figures for employee productivity. Mastery in this area means focusing on a complete set of metrics that record both inputs and outputs. Monitoring productivity and cycle-time differences between teams and individuals, for example, can be more critical than tracking labor costs.

Global delivery networks
A number of organizations have followed the industrialization model for building global technology-delivery networks. Take, for example, Infineon Technologies, headquartered in Munich and one of the world's largest semiconductor manufacturers. To stay competitive in a volatile industry, Infineon set out to streamline the management of its SAP applications suite and to better align IT solutions delivery with its overall corporate strategy. The company worked with a partner, which assumed worldwide responsibility for SAP application maintenance and services. The partner was able to draw on the resources of three of its global delivery centers—in the United States (Wilmington, Delaware), Slovakia (Bratislava) and the Philippines (Manila), one delivery center for each major region of Infineon's operations—to stay within aggressive time and cost parameters.

And Paris-based Rhodia, a major global manufacturer of specialty chemicals, took an industrialized approach to improve the efficiency of its finance function, which had been scattered across more than 60 locations in seven countries. By transferring the function to a shared services center in Prague, the company was able to reduce the unit's costs by 30 percent. (For a more detailed account of the project, see "Rhodia makes its move," *Outlook*, January 2003.)

Taking an industrialized approach to IT can provide some unexpected benefits. Most organizations have been focused on the obvious savings that come from replacing one component of cost with a less expensive one. And in most instances, although they have taken this approach as far as it can go, they are still under pressure to deliver IT solutions for less money.

An industrialized approach to IT gets at costs that most organizations now don't even see. It does this by focusing more broadly on how the work itself can be performed differently and better so that IT can become not just more efficient but also a source of value by delivering superior, often innovative, solutions. ■

Innovation

Bold new world

By Glover T. Ferguson and Stanton J. Taylor

The innovative application of new information technology not only powers significant advances in business practices. Even more important, it can also produce the breakout new product, service or business model.

Innovation is a pervasive theme in any discussion of high-performance business. Nowhere is this axiom truer than in the realm of information technology, which is often the frontier of innovation in business.

The best businesses are always seeking ways to improve their IT assets and experimenting with new systems and methodologies. They recognize that innovative improvements in their IT capabilities can power significant incremental earnings increases through better and less expensive customer service and greater productivity, and can also enable important reductions in SG&A.

Been there, done that

Several leading retailers are beginning to adopt RFID technology throughout their business systems. For example, in the United States, Wal-Mart is hoping to have RFID tags on all vendor pallets and cases by 2006.

There's more. DHL plans to go global with RFID tracking for the millions of packages it handles each year. The payoff in customer service: later posting times and earlier deliveries. The US Department of Defense has gotten into RFID technology—on a huge scale: All matériel sent to the Persian Gulf for the Iraq conflict was tagged for fast, easy tracking. For one unit, the time required to take inventory of incoming equipment shrank from two or three days to 22 minutes.

Ironically, however, even technologies like RFID, no longer really count as innovation—at least, not as they are normally used. They are coming to be considered a cost of doing business, not sources of competitive advantage.

Of course, these technologies are important and well worth the investment—but competitive advantage may well be found only by discovering new, innovative ways to use or leverage them. The answer to the question, "What else could this let us do?" can be applications that are reasonable in cost because the basic technology installation and learning is in place. Moreover, technologies like RFID typically converge with other technologies, such as sensors, remote cameras and wireless capabilities, to create a new layer of infrastructure that can enable the next big breakthrough.

High-performance companies understand that it is the innovative application of new information technology that will produce the most significant advances in their business practices. Even more important, IT can produce the breakout new product, service or business model. The light bulb, after all, was not developed through continuous improvement of the candle. It was a dramatically better solution to the need for light, made possible through technology advances.

According to Gartner, "CEOs and CIOs are discovering that, in a difficult economy, early adoption of emerging technologies can give their companies a competitive edge."[1] Accenture believes that high-performance businesses see technology innovation as a way to take the lead, rather than be a "me too" follower. These companies are quick to adopt new technologies, and to drive their adoption throughout their business system, so that they capture the competitive advantage.

Look at Amazon.com. Originally an e-commerce bookseller, Amazon.com

[1] Gartner, Inc., "Strategic Technology Planning: Picking the Winners," J. Fenn, A. Linden, S. Fairchok, 9 July 2003.

is boldly transforming itself from a retailer into a technology company by offering the technical prowess behind its sophisticated website and search capabilities to other merchants, which sell their products via Amazon.com. What's more, it is making its underlying web services, such as its product database and online shopping cart, available to independent programmers who are creating dozens of new applications that small merchants can use to sell on the Amazon.com site or elsewhere.

The economics are compelling: Some analysts estimate that within a few years, more than half the products sold on Amazon.com could be those of other retailers. Amazon.com incurs no distribution or handling costs from this business, and takes a commission of about 15 percent. The outlook, according to analysts, is for healthy increases in sales and operating margins; indeed, in January 2004, the company announced its first full-year profit, for 2003. Down the road, Amazon.com envisions itself as the dominant platform—a retail parallel to Microsoft Windows—by which anyone could buy or sell essentially anything.

Innovation by design

The most successful companies do not leave innovation to chance. "Many [CEOs and CIOs] are looking to set up a formal procedure that would smooth the way for the introduction and implementation of these [emerging] technologies," Gartner analysts confirm. "Of course, technology eventually will find its way into the workplace, with or without planning—but companies that fall back on a reactive, 'as needed' approach in their adoption of new technologies run the risk of making costly, personality-driven choices, rather than tactical decisions that align with their larger corporate strategy and goals."[2]

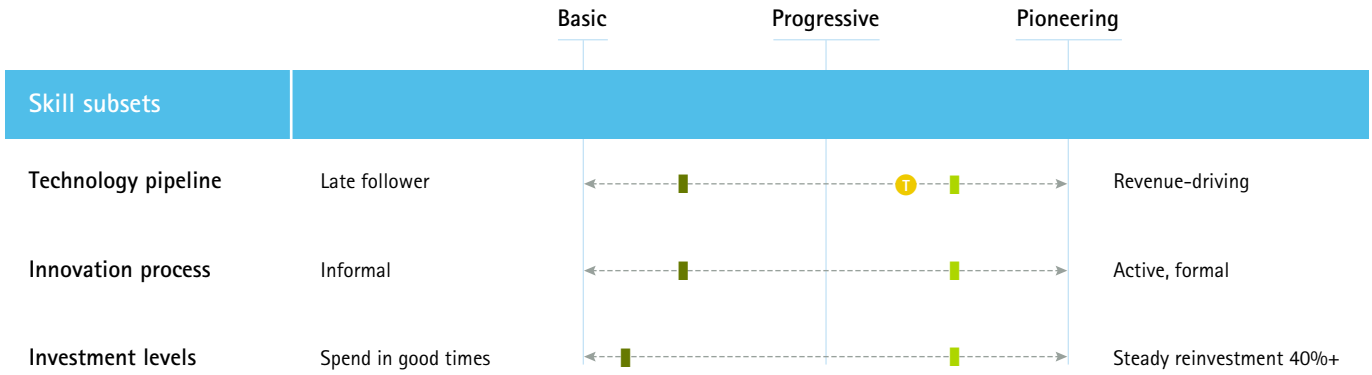
How does a company create a successful innovation program? There is no single solution or formula, but success does require mastery of at least three key components of the innovation process.

1. Forge a lab–business partnership
Much as we would like to think otherwise, great new products

[2] Ibid.

High-performance innovation

The chart below breaks down innovation into skill subsets and assesses mastery on a rough scale, from "Basic" to "Pioneering." The symbol ▮ indicates the average level of mastery for each skill subset; ▮ indicates the highest level observed; Ⓣ indicates the state of readiness of commercially available IT tools to help companies achieve mastery in this area.



SOURCE: ACCENTURE ANALYSIS

High-performance businesses have a formal method for tracking new technologies as they approach the point of business value and for ranking their potential impact on the bottom line.

and services don't simply roll out of R&D labs, through marketing departments and into the hands of eager customers. A successful innovation program calls for two-way communication and a "meeting of the minds" between groups with different perspectives. Why?

- Managers and key employees on the business and marketing side may have their heads down, focused on meeting sales targets and other performance goals. As a result, they might be blindsided by technological change and the ensuing competitive upheaval. The organization's leaders, managers and marketers need greater awareness of what is happening on the technological frontiers so that they can develop a vision of the future, anticipate change and prepare to use new technology creatively.

- Scientists and engineers often need a reality check to be sure their projects are in tune with what the market can and will accept. The successful product may not always be the superior technical solution, which is why the Concorde isn't flying. The folks in the white lab coats need a better understanding of exactly how a new product can be turned into market advantage.

Opening up and maintaining communications between these two groups is the key to ensuring that R&D initiatives are based on a solid understanding of corporate needs and goals and market realities, and that leaders on the business side understand the possibilities of emerging technologies and are prepared to support and embrace them.

This information exchange becomes especially important as an organization grows beyond a compact site where watercooler meetings and other informal contacts are adequate means of communication. The best organizations, as they mature, create forums that bring together their technology and business sides. Often, they also include outside thinkers in business and technology to broaden the horizons of everyone in the organization.

The ideal is to bring together individuals who have deep industry expertise, technical competence and an awareness of emerging information technology—and to allow them to imagine, think and plan together. A global chemicals company did just that when it turned to a partner's industry experts for help in improving asset utilization, then worked with the partner's scientists to come up with ideas on how the concept could be implemented. The company adopted the recommendations, funded a pilot program and helped sell the results to one of its business units.

2. Look in the right direction

The best companies continuously scan their own organizations and industries, looking for obstacles or opportunities. What are the problems that, if solved, would have the greatest impact on the bottom line? What strategic area of the business offers the most potential for breakthrough performance?

High-performance businesses are also on the lookout for promising emerging technologies. They have a formal method for tracking these technologies as they appear and approach the point of business value, and for ranking their potential impact on the company's bottom line.

This scanning for new technologies is not without focus. Some areas of technology hold more promise than others and merit the longest and most intense look.

Accenture, for example, believes that the most exciting opportunities today spring from the convergence of numerous technologies that gather new forms of information—RFID tags, sensors, miniature cameras and microphones, GPS, biometric devices—that enable "smart" objects to not just report passively on their status but to actively intervene on their own behalf or in pursuit of some busi-ness goal. When these technologies are combined with wireless capabilities, the Internet and massive computing power, it becomes possible to use this data to provide context-rich services.

The trucking industry provides a good example. Each year, the industry chalks up more than $10 billion in losses from truck and cargo theft; the security risks associated with transporting hazardous materials compound the problem. Accenture Technology Labs has developed a Transport Security Services prototype that ensures security door-to-door.

RFID tags and sensors make the products and whatever they're shipped in intelligent and interactive. Computers placed in the trucks, GPS installations and biometric identification systems verify fingerprints and irises. As a result, the truck, its contents and all personnel who come into contact with the vehicle can be tracked and verified. By building on this system, it becomes possible to route each truck in the most fuel-efficient way, and to ensure that chemicals or other dangerous cargo are not accidentally mixed or mishandled.

This convergence of technologies holds real promise for delivering business value. Some of these technologies are already reaching critical mass today, yet their market application in nearly every industry is still almost completely unexplored.

3. Go to market smart

When the best innovators find a promising idea and prepare to take it to market, they do so carefully, in stages, and always with an eye on both technical feasibility and business reality.

Researchers rigorously test promising ideas to validate the technology, determining whether it has been tried before, testing for flaws, and usually building pilots or prototypes. All the while, though, they stay in touch with leaders on the business side, keeping them abreast of progress and listening to their concerns and suggestions. That's because a successful innovation will be far out—but not too far out. To be successful, it needs to pass a twofold test.

- It must offer something exciting enough to compel people to buy. That means it has to represent enough of a step forward in cost, functionality or even something as intangible as image so that people will undergo the temporary inconvenience of change. Benefits must be significant, visible and understandable. It's hard to imagine building excitement around a new portable CD player, for example, but Apple Computer's iPod is quite a different story.

- At the same time, the innovation should not create its own obstacles or disincentives. As much as possible, it should fit in with existing infrastructure, skills, values and work practices. Electric cars aren't a market force, because no one knows where to plug them in, but hybrids are selling, because they use gasoline—and much less of it.

A technology that meets this twofold test is the digital pen application developed by Accenture Technology Labs, which combines the familiar functionality of a pen and paper with the computer's ability to capture and store data. HBOS, the organization that emerged from the September 2001 merger of Halifax and the Bank of Scotland, has field-tested the application. This is partly because it enables the company's salespeople to concentrate on the customer (and not the computer screen) during the actual sales conversation, but also because it eliminates the time-consuming task of data entry after the sales call that would be necessary with an ordinary pen or pencil—and it accomplishes all this with minimal investment in equipment and staff training.

Once the technology has been tested for feasibility, researchers and business managers work together to build a business case that answers a number of hard questions.

Does the technology offer significant new ways of doing business? Build on existing infrastructure to capture substantial new value? Create a new technology platform that enables future applications? Is the technology within reach for the company—stretching the organization's capabilities but not forcing it outside of its envelope of possibility? Can the company develop and implement the technology alone, or will it need partners? How fast will the opportunity develop? Are there ways to open the door to acceptance, such as through try-before-you-commit programs or other incentives?

Then comes the crucial decision: Do you move forward? Abandon the initiative? Or shelve it for a future time when more favorable conditions, such as a threshold of

technical maturity or critical mass, have been reached? If the decision is a green light, high-performance companies already have momentum because the collaborative relationship between the technology and business sides has already begun to instill a vision and excitement throughout the organization.

Innovation in action

How is this general model applied in actual companies? One example is BP. Company researchers actively scan the horizon for ideas, spending time at centers of innovation, which include new technology startups as well as established players like Microsoft Corporation. In addition, BP invites 50 top business leaders each year to two-day events focused on an area of emerging technology or process innovation that has the potential for high impact. These forums (called Blue Chalk events) include guest speakers from other businesses that are using the technology, as well as brainstorming sessions and breakout discussions with world-class experts and academics.

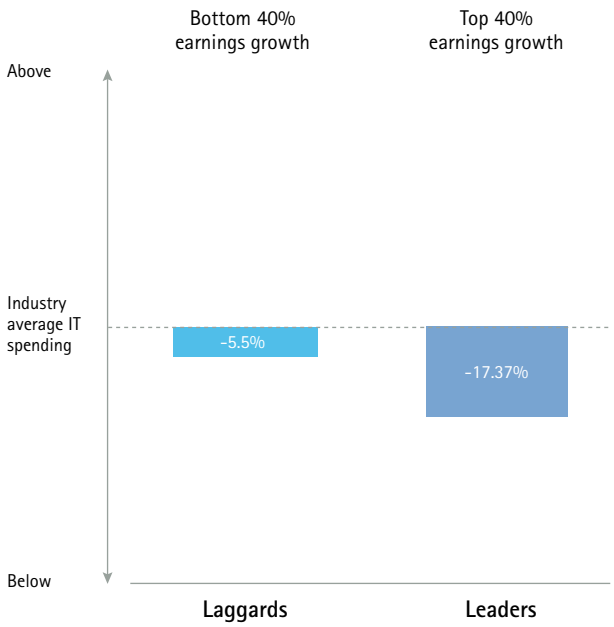
BP staff members then take promising ideas back to their business function for development. Senior management provides visible support throughout the development process, encouraging business units to find and initiate pilot projects.

Many innovation-focused organizations, even those with extensive R&D programs, look outside their own walls for assistance, especially in the

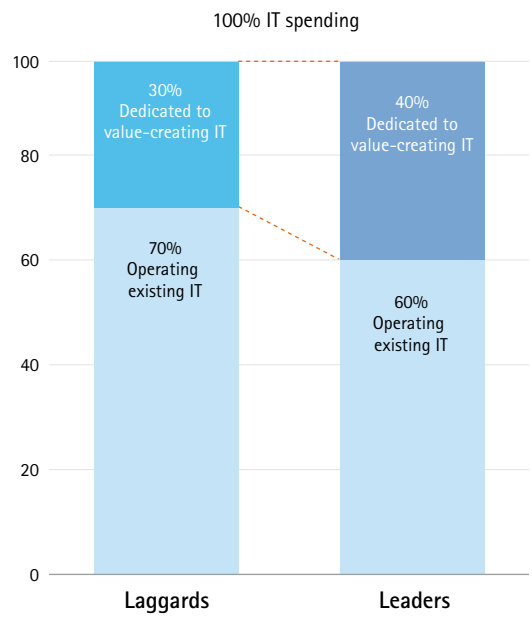
IT investment: Avoiding the austerity trap

Reinvestment in IT is critical to driving earnings growth—and high performance. The key, however, is not overall spending but the allocation of IT investment to innovation rather than to operations.

Companies with superior earnings growth spend less on IT . . .



. . . but they allocate more IT investment to new productivity.



SOURCE: 2002 ACCENTURE SURVEY OF 112 MANUFACTURING AND DISTRIBUTION COMPANIES; 2001 GARTNER IT SPENDING AND STAFF SURVEY

early stages of searching for promising technologies and developing a vision based on working models.

IDEO, for example, is a California-based design and development firm that became famous in 1999 when a team of its designers appeared on the US news program *Nightline,* where they accepted and eventually met a challenge to completely rethink and redesign the standard grocery shopping cart—in just four days. This firm helps clients envision innovative possibilities by first seeing their current product or service through the eyes of users—"Innovation begins with an eye," IDEO maintains—and then following through with brainstorming sessions and iterative quick prototype development.

Executives from The Irish Revenue Commissioners attended a workshop where they saw a knowledge-integration prototype that could be applied to their task of fairly and efficiently collecting taxes. The prototype would enable users to probe multiple data repositories and incorporate Internet searches, then display the results as a single, holistic web that could reveal unanticipated relationships between pieces of information. The auditors' research would be better and faster, and would provide a deeper understanding of special interest cases. After a successful pilot, the solution is now being rolled out for more general use.

Accenture's vision of the future, which we call Reality Online, is based on our own tracking, over the years, of a range of technologies that will enable organizations to generate new classes of information, enhance access to that information and use it more effectively for business advantage.

Investing in innovation

High-performance businesses invest in technology innovation with a focus on long-term success as well as on short-term cost efficiencies. And because the innovation process is closely tied to business needs, investments have strong management support.

How much actual funding the best companies commit to technology innovation is difficult to know. Studies offer a range of numbers, which are determined primarily by how a company defines innovation and technology. As a general guideline, though, Accenture believes that top-performing innovative organizations routinely reinvest about 40 percent of their discretionary IT funds into upgrading existing technologies as well as into building new systems and technology capabilities. The best companies are also creative about investing jointly with partners and vendors, assuming it is a winning arrangement for all parties.

The amounts invested are less important than the perspective these companies take on investing. While they may manage some aspects of their overall IT investment with an eye to cost control, they manage IT innovations with an eye to creating real business value. They recognize they are not investing in technology innovation per se but in business innovation.

These companies also adopt the portfolio perspective of a venture capital firm. They do not place unduly high expectations on any particular technology idea or initiative, because they recognize that they are managing a pipeline of ideas. The pipeline is, in fact, a funnel, with a large number of ideas entering one end and an ever decreasing number passing through the successive stages of development.

The best leaders recognize that if even a handful of ideas reach payback—and if even one leads to a business breakthrough—the investment will be worthwhile. Some even take a portfolio approach to ROI expectations, setting a target that would be unreasonable to expect in the short term from any one idea, given the hit-or-miss nature of innovations, but that is feasible as a benchmark for a pool of ideas.

And they invest steadily, year after year. Maintaining a consistent level of funding for technology innovation is far more important than the actual amount, and it's more constructive than having wild swings between well-funded years and lean years.

Consistent financial support is critical to attracting and retaining the best research talent, which otherwise would look for more secure employment elsewhere. Consistency ensures that ideas keep flowing through the pipeline, and that they can be developed quickly once conditions support their business value. ■

About the contributors

Glover T. Ferguson, Accenture's chief scientist, heads global technology research and innovation initiatives at Accenture Technology Labs, the company's research and development organization. Mr. Ferguson, who joined Accenture in 1974, has shared his perspectives in publications such as *Fortune, The Economist,* the *Financial Times,* the *Journal of Business Strategy, The Wall Street Journal, Information Week, Time, Harvard Business Review* and *CEO.* He also writes regularly for *Outlook,* for which he is a senior contributing editor and author of the "On the Edge" column. Mr. Ferguson is based in Chicago.

glover.t.ferguson@accenture.com

James Hall is the managing partner of the Accenture Technology, Alliance & Solutions service line. In this role, Mr. Hall is responsible for the company's vision and strategy for the technology marketplace as well as for its own investments and capabilities in IT. In his 13 years as an Accenture partner, Mr. Hall has held a range of positions, which have included managing various operating units, overseeing key strategic initiatives and serving as managing partner of Accenture UK from 1994 to 2000. Mr. Hall, who is based in London, is a member of the company's executive committee.

james.hall@accenture.com

Keith Haviland, a London-based partner in the Accenture Technology practice, has led some of the company's largest and most complex development projects. He has led the creation of a network of delivery centers in the United States, Europe, India, the Philippines and China. He is author of *UNIX System Programming* (Addison-Wesley Publishing Company, 1988) and *The Digital Lexicon* (Financial Times Management, 2001).

keith.haviland@accenture.com

Jon Hill is an associate partner in the Accenture Global Enterprise Integration practice. He has more than 12 years' experience working with organizations to match their application architecture requirements to the appropriate technology strategies as well as to meet their business objectives. Mr. Hill serves as the company's enterprise integration market and vendor intelligence lead. He is based in Dallas.

jonathan.w.hill@accenture.com

Doug Kasamis is a partner in the Accenture Strategy & Business Architecture service line, and he leads the company's Infrastructure Planning and Transformation practice. With more than 18 years' consulting experience, Mr. Kasamis has helped his clients, which include companies in the financial services and manufacturing industries, as well as entities in the public sector, transform their global IT capabilities. He is based in Chicago.

douglas.l.kasamis@accenture.com

Stephen Nunn, a London-based associate partner, heads the Accenture Global Architectures & Core Technologies Technical Platform specialty group for Europe, the Middle East and Africa. Mr. Nunn, who holds professional qualifications in telecommunications engineering, specializes in infrastructure and operations engineering. Currently, he is working on large-scale global IT consolidation programs.

stephen.nunn@accenture.com

David E. Plesko's career at Accenture has focused on integration. The Dallas-based partner is the leader of the company's Global Enterprise Integration practice, and he was the founder and builder of the company's initial work in this area. Mr. Plesko's specialties include large, complex technical architecture implementations across a range of the company's operating groups.

david.e.plesko@accenture.com

Anthony Roby is a Chicago-based technology partner. He is responsible for Accenture's architecture strategy and asset development programs; he also manages the Accenture Web Services practice. Mr. Roby, who has more than 15 years' experience delivering enterprise infrastructure and technology architectures across a broad range of platforms, sits on the board of directors of the Web Services-Interoperability Organization.

anthony.roby@accenture.com

Basilio Rueda is the managing partner of the Accenture Global Delivery Network. Mr. Rueda directs a technology workforce of 15,000 people worldwide, composed of local units in main client geographies as well as offsite global units. He also is responsible for Avanade, a subsidiary co-owned with Microsoft. Based in Madrid, Mr. Rueda has held numerous management roles in IT and outsourcing.

basilio.rueda@accenture.com

Bob Suh, a Boston-based managing partner, leads technology strategy for Accenture's global Technology, Alliances & Solutions business. He is a member of the Accenture Technology & Outsourcing Executive Committee, which governs the company's business in software, applications, core technologies, global software development and infrastructure.

bob.suh@accenture.com

Stanton J. Taylor is the managing director of Accenture Technology Labs. With more than 17 years' experience in strategy and technology consulting, Mr. Taylor works with clients, as well as within Accenture, to conceptualize, design and implement emerging technology solutions for competitive advantage. He has assisted more than 50 organizations in defining and implementing their eCommerce strategies. Mr. Taylor coauthored *A Practical Guide to Client/Server Computing* (Auerbach Publications, 1996) and *Netcentric and Client/Server Computing: A Practical Guide* (CRC Press—Auerbach Publications, 1998). Mr. Taylor is based in Chicago.

stanton.j.taylor@accenture.com

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Companies and organizations mentioned in this issue are indexed to the pages in which each is mentioned.

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Outlook
Special Edition
May 2004
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