Delivering software as a **service**

A new delivery method is shaking the software industry's foundations. Traditional vendors should take heed.

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The online delivery of software—sometimes labeled software as a service—has been a long-standing dream for some vendors and CIOs. The concept is simple and attractive: rather than buying a software license for an application such as enterprise resource planning (ERP) or customer relationship management (CRM) and installing this software on individual machines, a business signs up to use the application hosted by the company that develops and sells the software, giving the buyer more flexibility to switch vendors and perhaps fewer headaches in maintaining the software. For many years, traditional software vendors (those who sell licensed and packaged software, often along with a maintenance contract) have been able to overlook a rising crop of competitors that offer software as a service, as the latter have struggled to develop truly competitive services. It's now time for traditional companies to pay attention, for they risk losing their privileged position to attackers that offer applications in this new way.

The complacence of traditional vendors is easily understood in light of the record: the first generation of online software delivery, in the late 1990s, failed to meet the reliability and quality standards demanded by business users. But the new delivery method appears to be taking off. While it won't replace existing licenses and in-house custom-developed code overnight, an

Article at a glance

Traditionally, companies buy software and then install and maintain these applications on their own machines. That model is giving way to one where companies will buy subscriptions and access services over the Internet from software developers that host their own applications.

Some applications will migrate to the new delivery model faster than others, but all software makers should begin to explore the economics and necessary capabilities for online delivery.

Revenue models for these developers will change, since software as a service delivers fees over time rather than large up-front license purchases.

Customer service and R&D capabilities will also need to adjust to the reality of ongoing relationships with customers rather than periodic upgrades.

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IDC report[1] projects that 10 percent of the market for enterprise software will migrate to a pure software-as-a-service model by 2009. Our analyses suggest that software as a service is a growing priority for CIOs and venture capital investors.

Our review of venture capital investments shows that companies whose main business is delivering software as a service saw their revenues rise from \$295 million in 2002 to \$485 million in 2005, an 18 percent increase. On the buyer's side, our fall 2006 survey of senior IT executives indicated a dramatic jump in the number of companies considering software-as-a-service applications during 2007.[2]

With software as a service, a customer contracts to use an application, such as ERP or CRM, hosted by a third party, rather than buying a software license and installing the application on its own machines. Just as consumers can check e-mail or use mapping programs with their Web browsers, so too can enterprise customers access business applications over the Internet.

Several factors are spurring the growth. New software design and delivery models allow many more instances of an application to run at once in a common environment, so providers can now share one application cost effectively across hundreds of companies—a vast improvement on the old client-server model. Bandwidth costs continue to drop, making it affordable for companies to purchase the level of connectivity that allows online applications to perform gracefully. Perhaps most important, many

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[1] *Worldwide and US Software as a Service 2005–2009 Forecast and Analysis: Adoption for the Alternative Delivery Model Continues*, IDC, March 2005.
[2] Janaki Akella, Kishore Kanakamedala, and Roger P. Roberts, "What's on CIO agendas in 2007: A McKinsey Survey," *The McKinsey Quarterly*, Web exclusive, January 2007.

customers are eager for the shift, as they're frustrated by the traditional cycle of buying a software license, paying for a maintenance contract, and then having to go through time-consuming and expensive upgrades. Many customers believe they would have more control over the relationship if they simply paid monthly fees that could be switched to another vendor if the first failed to perform (see sidebar "How CIOs can get maximum value from software as a service"). And finally, the successes of early leaders, such as salesforce.com and WebEx, have demonstrated the viability and value proposition of this model.

Market indicators suggest that investors share the enthusiasm of vendors and CIOs. Our index of companies whose main business is software delivered as a service[3] outperformed the overall software company index (excluding Microsoft) by more than 13 percent from January 2002 to December 2006.

Although software-as-a-service vendors are less profitable than some traditional software vendors today, this gap is primarily caused by a lack of scale. We expect the economics of online delivery to change as the model gains wider acceptance. Large software companies (excluding Microsoft) typically have operating margins of around 25 percent. However, the margins of companies with revenues below $1.2 billion a year hover around 14 percent—close to the 13 percent margin of the average software-as-a-service vendor (Exhibit 1). A few service vendors already have much higher margins (WebEx, at 26 percent, and Digital Insight, at 19 percent) because they've been able to achieve scale and a leading position in their niches. Other leaders, such as salesforce.com (which provides on-demand CRM and sales force automation tools) and ADP (the world's largest automated check processor) have also gained mainstream uptake among midsize and large companies.

Traditional software vendors across many industries, we believe, will find their privileged position threatened unless they move aggressively to serve their customers by making software applications available online. To be successful, vendors will have to understand the rules of the new game, especially how customer service and sales models differ, and adjust accordingly. They'll need to grasp why software is moving to this model and how the new economics affect customers, intermediaries, and providers—not only software developers, but also IT and business

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[3] The index included the performance of the following companies from January 2002 through December 2006: Concur Technologies, Digital Insight, Digital River, RightNow Technologies, salesforce.com, Taleo, Ultimate Software, WebEx, WebSideStory, and Workstream.

How CIOs can get maximum value from software as a service

Software as a service offers several advantages to IT buyers, including more frequent (and potentially less painful) upgrades, a lower cost of ownership (up to 30 percent less for a CRM implementation, as the exhibit shows), and a higher level of service from vendors that must become more responsive to customer needs or risk losing subscription revenues. Countering these benefits are the acknowledged risks of reliability (how can IT departments ensure that the business can access its applications?) and security (how can it guarantee data privacy in line with regulations?). In addition to these broad concerns, CIOs and other IT managers must make changes in their architectural, managerial, and governance models to capture the full value of this new model.

Since most IT systems have been designed as closed systems with a few controlled links to the outside world, CIOs will have to shift their thinking about architecture to a hybrid model of closed and open systems. In a review of which systems should be wholly internal and which should be leased as a service or completely outsourced, the business must consider not only data security but also the pace at which different applications are evolving. This hybrid nature of business applications, which will increasingly look out as well as in, will also affect decisions on middleware. A comprehensive redesign of a company's IT architecture must take this factor into account to help the company avoid creating a new system that is as complex or unstructured as the legacy system being replaced.

Second, the move to software as a service is frequently justified not only by the lower cost to own but also, and more important, by its promise to deliver better service than licensed software can with a maintenance contract. In order to get the full benefit of that improved service, IT organizations need to be able to match these service-level guarantees and link them with internal commitments to business users and end customers. For example, if a software-as-a-service vendor guarantees a service level on invoice-processing speed, the IT department must ensure the availability of the purchasing department's infrastructure system that supports this function. If the vendor cannot match its competition's level of service, then it will fail to realize the full benefits from the switch.

Third, IT managers will need to work closely with their business colleagues to refine IT governance mechanisms to capture the best business value from online delivery. Departmental charge backs, for example, will require some redesign as software moves from large capital expenditures to smaller but ongoing operating expenses (specifically, the recurring subscription fees). Decision rights will also have to be modified. Explicit mechanisms, for example, will be needed to determine who decides the level of customization of software and who pays for it when two departments want to use the software but only one requires modifications. Customers and vendors will need to identify who should control the intellectual-property rights on modified software.

Taken together, all of these changes signal that IT leaders will need to do more than simply plug in new hosted applications; they must revisit the foundations of the IT organization in order to ensure a smooth and fruitful transition to the new model.

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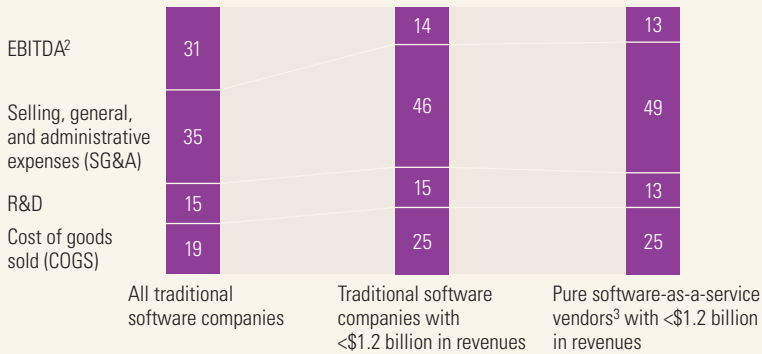
Total cost of ownership differs

Sample deployment of customer-relationship-management (CRM) software (200-seat license)

	Total cost of ownership, $ thousand		
	Software on premises	Software as a service	Sources of savings with software as a service
Implementation, deployment			• Reduced deployment time, limited customization, self-service through on-boarding scripts
Customization, integration	108	72	
Basic infrastructure testing, deployment	54	0	• Does not require infrastructure and application testing
Application infrastructure testing, deployment	30	0	
Ongoing operations			• Lowers training requirements through –Simpler user interfaces –Self-training, service capabilities
Training	101	34	
Management, customization of business process change	94	0	• Does not require ongoing business process change management – Vendors monitor customer usage to enhance offering – Customers provide feedback to influence feature functionality
Data center facilities rental, operations; security, compliance; monitoring of incident resolution	750	0	• Includes vendor's costs to serve in subscription price (ongoing operations, back-end hardware and software)
Software			
User licenses, subscriptions; maintenance	480	1,500	
Other			• Provides 99.9% general-server availability vs 99%
Unscheduled downtime	308	0	
Unused licenses	92	0	• Reduces unused licenses by 20%, users added as needed
Total costs (including those not shown here)	2,298	1,640	

EXHIBIT 1

Economics of software companies

Breakdown of profit and loss line items as % of top-line revenue[1]

	All traditional software companies	Traditional software companies with <$1.2 billion in revenues	Pure software-as-a-service vendors[3] with <$1.2 billion in revenues
EBITDA[2]	31	14	13
Selling, general, and administrative expenses (SG&A)	35	46	49
R&D	15	15	13
Cost of goods sold (COGS)	19	25	25

[1] Averages, based on latest available annual financial data for each company.
[2] Earnings before interest, taxes, depreciation, and amortization.
[3] Includes Concur Technologies, Digital Insight, Digital River, RightNow Technologies, salesforce.com, Taleo, Ultimate Software, WebEx, WebSideStory, Workstream.

Source: Company annual reports; McKinsey analysis

process outsourcing providers. They will have to make changes in their own organizations by ramping up their ability to deliver software from large data centers and by developing new ways to sell to and service their customers. The sooner software companies embrace the change, the better access they'll have to top talent and new markets and the better off they are likely to be in the long term.

Emerging potential

The first wave of adoption for software as a service has been under way for several years. Companies are eager to acquire the technology for human-resources applications such as CRM and payroll and for collaboration tools that aren't mission critical, involve relatively low data security and privacy concerns, have a distributed user base, and require little integration with on-premise applications and little customization. In addition, several industry-specific applications are gaining popularity in large industries such as financial services, health care, and retail, as well as in smaller ones such as automotive retailing, law, and real estate.

The next wave of applications seems likely to involve transactions between buyers and suppliers, including procurement, logistics, and supply chain management. As customers grow increasingly comfortable with the concept,

a third wave of applications more critical to business, such as hosted environments for software development, may also start to be delivered in this way. Enterprise customers and those in small and midsize businesses are likely to adopt applications at different rates. For example, some smaller businesses are already embracing the online delivery of financial applications, whereas large enterprises may never do so because of the breadth and depth of functionality required or because of concerns about data security (Exhibit 2).

All three waves mostly aim to replicate the functionality of applications that have been sold as packaged software and hosted on the customer's site. The next frontier—we might call it software as a service 2.0—will include new classes of applications which are actually better suited for online delivery and seamlessly integrate with on-premise applications. Consider spam- or virus-protection applications, which are superior to e-mail filters because they stop junk e-mail or harmful viruses before they enter a company's fire wall. Other well-suited applications are those that perform some kind of data reconciliation, like software that reconciles differing SKUs between suppliers and retailers. Such products will increasingly rely on repositories in "the cloud."

What software vendors must do

Software developers that shift from a traditional licensed model to software as a service will need to work hard to retain existing customers. Companies that have purchased long-term contracts for updates and maintenance, for example, will want guarantees of favorable subscription pricing under the new model. Others may be so comfortable with their current setup that they will switch only if the software vendor makes it painless, perhaps even free. Additional issues to consider during the transition from packaged software to software as a service include R&D and customer support—not all customers will switch at the same moment, so vendors may need to run dual operations in these parts of the business.

Under the new model, the economics of the software and IT services industries will also change. Vendors will have to adapt their financial and operating models or risk losing their privileged positions (see sidebar "The threat to BPO vendors").
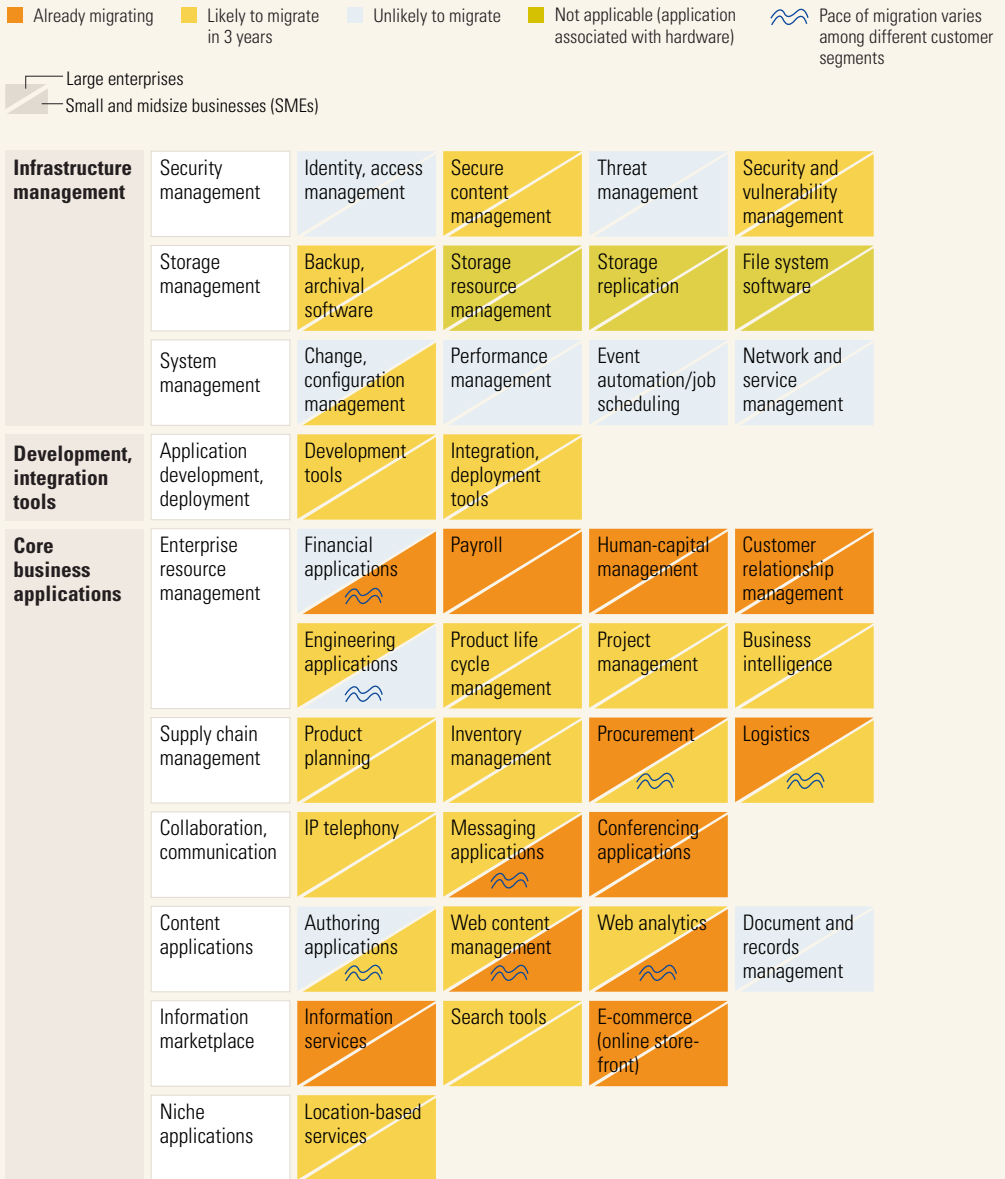
Adjust the revenue model

Software developers that deliver software as a service experience higher sales and marketing costs relative to earnings than traditional vendors do. There are at least two reasons. First, a subscription model for software produces lower revenues during the growth phase, since payments are

EXHIBIT 2

Migration of software applications

Migration of applications from traditional delivery to software as a service

■ Already migrating   ■ Likely to migrate in 3 years   ■ Unlikely to migrate   ■ Not applicable (application associated with hardware)   ∿∿ Pace of migration varies among different customer segments

⬜ Large enterprises
⬜ Small and midsize businesses (SMEs)

Infrastructure management	Security management	Identity, access management	Secure content management	Threat management	Security and vulnerability management
	Storage management	Backup, archival software	Storage resource management	Storage replication	File system software
	System management	Change, configuration management	Performance management	Event automation/job scheduling	Network and service management
Development, integration tools	Application development, deployment	Development tools	Integration, deployment tools		
Core business applications	Enterprise resource management	Financial applications ∿∿	Payroll	Human-capital management	Customer relationship management
		Engineering applications ∿∿	Product life cycle management	Project management	Business intelligence
	Supply chain management	Product planning	Inventory management	Procurement ∿∿	Logistics ∿∿
	Collaboration, communication	IP telephony	Messaging applications ∿∿	Conferencing applications	
	Content applications	Authoring applications ∿∿	Web content management ∿∿	Web analytics ∿∿	Document and records management
	Information marketplace	Information services	Search tools	E-commerce (online store-front)	
	Niche applications	Location-based services			

The threat to BPO vendors

As more and more applications migrate to this new delivery platform, software as a service could be a disruptive force in the IT landscape by raising the competitive bar for business process outsourcers. As the products of software-as-a-service companies begin to rival those of outsourcing vendors, the latter will need to offer higher-value services to remain relevant, or perhaps develop and offer their own software delivered as a service. The competitive advantage of business process outsourcers in this area would likely be their deep knowledge of specific domains (for example, customer relationship applications based on extensive call center experience) rather than scale efficiency or lower labor costs. ADP, for example, has already moved in this direction, offering applications related to human-resources tasks as a service to clients. OpenAir, another provider of human-resources and financial-services outsourcing, offers online tools for tracking expenses. Ketera and SciQuest Technologies are emerging players in on-demand supply chain services, while Digital Insight provides an online-banking platform.

spread over a period rather than made immediately in a one-off license sale. Sales expenses in both models are expensed as incurred, however, leading to a higher ratio of costs to earnings for the service model. Second, a higher percentage of a service vendor's customers are small and midsize businesses: more effort is required to reach them compared with the large-enterprise customers that make up more of the customer base of traditional software companies. Over time, however, as subscription revenue streams become steadier, the service model may look better, since the incremental marketing and operating costs of adding additional subscribers and of offering new services and applications for existing customers are minimal.

The cost structure for online software as a service differs in other ways too. For example, software-as-a-service vendors have lower R&D costs than traditional software companies do because the former don't have to develop and maintain multiple versions of a product to run on different platforms. While they tend to have lower customer support costs (partly because they often limit customer service to self-help options rather than telephone support) and do not incur any product distribution costs (such as CD creation, packaging, and manuals), software-as-a-service vendors have higher costs for delivery than their traditional counterparts do because of the costs associated with hosting, bringing customers and users onboard, and managing the application and data center environments. Traditional software companies may also depend more on revenues from consulting services, which can often amount to two to four times the license fees. Consulting opportunities appear to be fewer in the software-as-a-service realm, where implementation is less challenging.

Build a platform

As in other radical shifts that have affected the software industry over the past two decades (PCs, client-server computing, and the Internet, for example), players who respond quickly to emerging trends will often be best placed. A first step, as noted earlier, is to understand which applications will migrate when and to position one's own offerings early in the uptake. For example, Siebel lost precious time by initially dismissing the idea of software as a service, allowing salesforce.com to steal a lead in the online delivery of CRM applications. Tracking the receptiveness of customers to the service delivery model is critical, so vendors will need to build organizational capabilities to monitor and shape demand.

For traditional vendors, a broad platform that allows them to supplement and enhance their applications is essential, as is deciding which platform to join. Most large software companies are adept at building these developer platforms in the licensed model (Microsoft's Windows platform being the best known). Platforms for software as a service are similar in that they require vendors to establish and evangelize a set of application-programming interfaces (APIs) and standards for data exchange among applications. But platform partners in the software-as-a-service model can also build onto the back-end infrastructure of applications, where the billing, metering, provisioning, and advertising functions may reside. This approach can reduce development costs for partners, but it also may increase those costs for the platform provider.

A second key difference between the models is that version upgrades tend to occur more often and in smaller chunks with software as a service than with the traditional approach. A platform vendor typically releases a major revision once every three to five years, and the company and its partners go to great lengths to make sure that the new version works with older machines and applications and that any upgrades from partners don't break the platform. The smaller but more frequent upgrades in the software-as-a-service model allow platform providers and partners to ensure compatibility continually with an ongoing investment in smaller increments.

In the migration to the online delivery model, partnerships are likely to change. Some competitors may become partners if their interests align on a common platform. Just as likely, some intermediaries (especially resellers and systems integrators) may find themselves cut out of a direct relationship with the developer and the customer unless they can find a way to add value.

The compensation structure, for both internal sales and channel partners, will need to change. Specifically, commissions will have to be based on ongoing customer usage and revenue rather than on the sale of large up-front licenses.

Improve internal capabilities

In the new delivery model, the sales and marketing function should follow the lead of those software-as-a-service vendors that are targeting the business side of the customer organization. One reason for this emphasis is that many of the early applications for online delivery—sales force automation, human resources, CRM—are pure business applications. Once they have demonstrated their value, IT managers may be more willing to adopt this mode for applications within the IT realm, including e-mail, security, and storage. Even CIOs who support the concept of online delivery may be concerned about the security and reliability of this new approach and so may hesitate to change if the current system isn't broken.

The biggest capability gap for software companies embracing the new model is in the operational and customer service skills necessary to deliver software online. The operational challenge is to host the software rather than shrink-wrap and ship it. Companies will have to develop capabilities to handle massive data center operations, systems and network monitoring, and billing.

Software vendors will also need to change their attitudes toward customer service. Complaints frequently involve incidents that are mission critical, thus demanding immediate attention. Systems outages and connectivity problems can affect all customers at once, implying large fluctuations in incident volumes, so first-line user support must be able to handle unpredictable spikes in inquiries. In our experience, moreover, software-as-a-service customers rely heavily on online tools, knowledge bases, and forums and as such represent a savvy and demanding user group.

R&D capabilities will also need to change. Smaller but more frequent online upgrades will demand new attitudes on deadlines and quality. While deadlines for upgrades can be flexible, the online release of a new version to the entire user base will have to be bug free. Also, the R&D department will need to expand its focus from the product and its features to the entire delivery model, including tools for serving the software, billing the customer, and aggregating different software services. Last but not least, to ensure a smooth end-user experience during releases R&D units must develop a customer service mind-set and collaborate with those parts of the

company that manage sales and delivery. This shift will require new processes, such as joint release planning, that resemble the way application-development and infrastructure groups operate in traditional IT organizations.

With most software vendors planning to offer their wares online in the next few years, a time of rapid industry change is approaching. Software industry executives will need to gauge the receptiveness of their customers to this shift and work out what services to offer and to which customer segments. They'll need to build up their internal capabilities for service delivery and to manage major shifts in R&D, business models, partnerships, and compensation models for sales teams and channel partners. They'll also need to monitor the rise of online platforms—and not just from established leaders (such as IBM, Microsoft, Oracle, and SAP) but also from pure plays like salesforce.com's AppExchange. And finally, they'll have to build the management processes and organizational structures to manage two distinct but potentially mutually cannibalizing businesses (traditional software and software as a service) with different business models and requiring remarkably different sets of capabilities. Although this challenge is formidable, software executives who continue to put it off risk being left behind. *Q*