

The Evolution to SaaS 2.0: Nonprofit Impact Report

Third Installment of the Blackbaud *Software as a Service* White Paper Series

INTRODUCTION

In recent years, the benefits of software as a service (SaaS) have become widely known among commercial enterprises. Nonprofits have also recently begun understanding how SaaS can help them free more time and resources for their missions. While software as a service has evolved considerably to provide the functionality and standards available today, next-generation software as a service — also known as SaaS 2.0 — will have very different drivers and requirements than the SaaS applications that exist today.

This white paper explores the future evolution of software as a service, including the changing drivers prompting the buying decision and the requirements SaaS vendors will need to meet in order to successfully transition to SaaS 2.0.

THE HISTORY OF SAAS

Software as a service has its roots in the application service provider (ASP) model, which met its demise in the late 1990s. ASPs “provide a contractual service offering to deploy, host, manage, and rent access to an application from a centrally managed facility at a low cost,” according to research firm IDC.

Although it showed much promise, the ASP model never experienced widespread adoption. Software vendors continued to require clients to purchase comprehensive applications, despite the fact that most only need a fraction of the functionality. In addition, few ASPs changed their licensing models to reflect the evolution of software delivered as a service. Large companies didn’t use ASPs because few start-ups offered the financial stability or scalability required by enterprise customers.

The term ASP, however, has slowly evolved into software as a service or “on demand,” as the technology and services offered by SaaS providers have progressed and advanced. According to IDC, the key characteristics of software as a service include:

- Network-based access to, and management of, commercially available software
- Activities that are managed from central locations rather than at each customer’s site, enabling customers to access applications remotely via the Web Application delivery that typically is closer to a one-to-many model (single instance, multi-tenant architecture) than to a one-to-one model, including architecture, pricing, partnering, and management characteristics.

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— IDC



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The evolution from ASPs to software as a service offers organizations additional cost savings, IT benefits, and favorable licensing and application packaging. Instead of the traditional licensing found with ASPs, organizations can “pay as they go.” Likewise, rather than paying for a colossal software application of which nonprofits use five percent of the functionality, software as a service vendors compartmentalize functionality into practical module applications, so organizations only pay for what they use.

A key characteristic of software as a service is “*application delivery that typically is closer to a one-to-many model than a one-to-one model.*”

– IDC

THE PRESENT STATE OF SAAS: DRIVERS

The current state of software as a service is driven primarily by cost and time savings on the part of the customer. Once driven by the novelty and innovation of conducting business online, organizations are now adopting SaaS solutions because of the convenience, productivity, and lower price tag afforded by the burgeoning software as a service industry.

Cost

Not unlike commercial companies, nonprofit organizations are both constrained and guided by limited budgets and the desire to focus as many financial resources as possible toward achieving their mission. The earlier ASP model, with its traditional software pricing model, did not produce the cost savings benefit necessary to attract nonprofit organizations. The evolution to software as a service, however, has met with a more favorable financial model for nonprofits, thus making cost savings a leading driver of the current software as a service market.

Requiring little upfront investment, SaaS appeals to nonprofits as a significantly less expensive way to “test drive” software without the risk, pain, and expenses normally associated with traditional client-server software. Organizations are charged for software as a service on a monthly basis, which helps spread the costs, and causes a limited impact on the nonprofit’s budget. In addition, the reliable IT cost forecasting over several years made possible by the SaaS model currently draws nonprofits to the model’s fixed subscription fees. Another factor driving the nonprofit sector’s adoption of software as a service is the lack of additional hardware, installations, upgrades, maintenance, and technical support it requires. Infrastructure, development, maintenance, and future innovation costs are spread across a broad base of users, so nonprofits aren’t responsible for additional costs beyond the software, such as hefty implementation fees, specialist IT support staff, and proprietary hardware.

Time

In addition to cost, time savings is the other key driver currently prompting nonprofits to purchase software as a service. Nonprofit organizations, like commercial companies, are driving to find efficiencies in their organizational processes in order to spend more time on their mission. The promise of up-to-date technology without needing regular updates is particularly appealing to nonprofits. Relieving the burden by taking care of system updates and maintenance automatically and invisibly, software as a service offers ongoing technology enhancements, which ensures that nonprofits are always ahead of the technology curve. For example, product improvements are available to all client organizations instantly.

Nonprofits are also adopting SaaS because of the convenience and increased productivity the remote accessibility affords. Available via the Internet, nonprofit professionals simply need web

access to use the software applications, enabling distributed organizations, multiple chapter sites, or traveling employees to continue working with real-time information at their fingertips.

While cutting costs and saving time are the two key drivers affecting nonprofit organizations' decisions to purchase software as a service, SaaS vendors are currently facing the following requirements and standards when selecting a SaaS vendor.

THE PRESENT STATE OF SAAS: REQUIREMENTS

Data security is top of mind when outsourcing any kind of technology service, however, the sensitive nature of credit card and personal donor information makes security that much more of a requirement for today's SaaS vendor. Fortunately, the industry provides two standards — PCI and SAS 70 Type II compliance — to ensure providers are upholding the highest security levels available and that nonprofits are protected as a result.

The 12-point Payment Card Industry Data Security Standard (PCI DSS) is a requirement of any entity that stores, processes, transmits, or comes into contact with cardholder data as of June 30, 2005. The standard also requires that organizations provide proof of compliance annually and submit to network scans performed by an independent vendor on a quarterly basis.

In addition, the completion of a successful SAS 70 Type II audit indicates that a service auditor has reviewed and tested a vendor organization's controls around data security. SAS 70 defines the professional standards adopted by a service auditor to evaluate the internal controls of a service organization, and the audit addresses control objectives in the following areas: System and Application Software Changes, Physical Security, Logical Access, Computer Operations, Environmental Controls, and Payment Processing. In addition, a successful SAS 70 audit addresses the five components of an internal control structure used by independent auditors to assess compliance with Sarbanes-Oxley legislation, namely, the control environment, risk assessment activities, control activities, information and communication systems, and monitoring activities.

But PCI and SAS 70 compliance are just two requirements today's SaaS vendor must meet. System performance and reliability are also of the utmost concern for nonprofits relying on their websites and technology systems for effective communications and donation collections. Current market requirements have driven SaaS vendors to house infrastructure equipment at Tier 1 data centers, as well as back-up business continuity centers. In addition, nonprofits are using data centers that offer multiple Tier 1 Internet providers, providing peak capacity handling and failover redundancy should any single connection fail.

Today's successful SaaS vendors are managing their systems 24x7 with state of the art application and network monitoring tools. In addition, 99.9 percent up-time — other than for scheduled maintenance — is now the standard, not the rule. SaaS providers handling transaction processing for nonprofits tend to be maintaining a payment gateway and connectivity to multiple payment processors for real-time transaction processing. Also, effective SaaS vendors are offering 24x7 phone and web support, application availability, a

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service level agreement (SLA), and a testing environment to meet today's requirements.

While saving time and expense are driving the decision for nonprofits to purchase software as a service today, the future drivers may look very different. And while organizations have successfully guided software as a service providers toward the standards and requirements that exist today, the evolution to SaaS 2.0 will mandate an entirely new set of requirements that SaaS vendors must embrace in order to survive in the future of SaaS. So what might SaaS 2.0 look like?

THE FUTURE OF SAAS

As both the needs of nonprofits and software as a service technology mature, the evolution to SaaS 2.0 will be spawned by new drivers: availability, scalability, and compliance.

According to research consulting firm, Saugatuck Technology, "SaaS 2.0 goes well beyond today's SaaS business drivers, which have focused on cost-effective software delivery. SaaS 2.0 is about helping users transform their business workflow and processes, and the way they do business." For nonprofits, SaaS 2.0 promises to provide new ways to raise money and reach constituents — and provide critical information to help organizations achieve their mission.

Availability

Fundraising is the lifeblood of a nonprofit. Without donations, organizations cannot fund their missions. And as both donors and nonprofits become increasingly reliant on the Internet as an avenue to give and receive contributions, the availability or "uptime" of the fundraising system will drive technology purchasing decisions.

In the near future, it will no longer be enough for software as a service providers to offer 98 or 99 percent uptime. Nonprofits can't afford to be down for minutes, much less hours, so system availability will be a critical driver in the future of SaaS. Tomorrow's vendors will need to offer 99.9 percent uptime (or better) in order to meet the changing availability requirements of the market.

In order to provide "always on" capabilities to nonprofits, tomorrow's software as a service vendor will need to build for availability in the following arenas:

Cross-functional coordination. New product and service initiatives at SaaS providers will need to be coordinated across departments, including product architects, networking groups, infrastructure team, and purchasers, to ensure the best possible service and maximum availability are delivered to clients.

Performance target identification. Software as a service vendors that build without a performance target of 99.9 percent uptime or better will not be equipped to meet tomorrow's availability standards.

Multi-level clustering. Architecting a SaaS system for availability means building a

Nonprofits are using data centers that offer multiple high-speed Internet connections to offer peak capacity handling and failover redundancy should any single connection fail.

SaaS 2.0 is about helping users transform their business workflow and processes, and the way they do business.

technology system and process which ensure high availability. Acting like a single system, clusters of servers at multiple levels in the process will enable requests to be transparently routed to another node in the cluster. The result is that the application will remain running without interruption and no observed failure.

Simulated grid environment. Deploying extra servers during high-traffic situations — instead of merely using them as back-up — will become a requirement, not an option in future SaaS environments.

Design with redundancy. Redundancy must be built throughout tomorrow's software as a service environment — from redundant network equipment to redundant servers to redundant circuits.

Isolated tenancy? An interesting future trend could be the shift from multi-tenant architecture to running a large organization's SaaS application on a dedicated server in a data center, further protecting nonprofits (both large and small) from widespread system failures.

Dual Tier 1 data centers. Hosting software as a service systems in rented space at two Tier 1 data centers will also become the rule rather than the exception. Using a primary and a back-up business continuity center, each offering multiple Tier 1 Internet providers, ensures data back-up should any single connection fail.

From seconds to milliseconds. The evolution to SaaS 2.0 will also mean greater expectations for failover time. While failover time within a second or two may be currently acceptable for SaaS providers, this will change dramatically with vendors being expected to improve failover times to the milliseconds in the future.

Scalability

In recent years, online donations and e-communications have grown exponentially in the nonprofit community — and the trend shows no signs of stopping. As organizations expand — and more of their business takes place online — scalability will become critical for SaaS vendors.

Today, new online vendors branding themselves as “software as a service” appear on the radar screen with great frequency. But the evolution to SaaS 2.0 will require vendors to make the necessary infrastructure investments to ensure the systems are capable of growing with organizations — and handling unexpected peak loads, like those during times of natural disaster.

Successful SaaS 2.0 providers will need to consider the following when developing scalability to compete in tomorrow's online nonprofit environment:

Bottleneck identification. Given the multi-tiered architecture of tomorrow's software as a service vendor, the purchase and implementation of tools to detect and analyze bottlenecks and hotspots will be needed to accurately locate problems when they occur.

It will no longer be enough for software as a service providers to offer 98 or 99 percent uptime.

Load testing of architecture. By definitively measuring the memory utilization, CPU utilization, operating system disk I/O, and other system measurements, providers will be able to determine how these areas perform under load.

Multiple Tier-1 Internet providers. By maintaining multiple Tier-1 Internet providers at both the primary and secondary data centers, vendors will ensure peak capacity handling and back-up should any single connection fail.

Connect to multiple payment processors. For software as a service vendors featuring transaction processing services, SaaS 2.0 will require that providers maintain a payment gateway and connectivity to three payment processors, including at least one direct connection, for real-time transaction processing.

Replicated systems. By maintaining replicated software as a service systems, SaaS 2.0 vendors' application servers will be able to direct incoming data requests to the replicated systems, doubling the throughput to the data repository.

Maximize concurrency. SaaS 2.0 providers will need to architect to more efficiently use application resources, such as sharing pooled resources like network connections and threads, caching reference data, segmenting large databases, and statelessness.

Rethink data normalization. Future software as a service scalability requirements may cause SaaS 2.0 providers to rethink accepted wisdoms about data management. The regulatory requirements for nonprofits are dangerously close to approaching what commercial companies face with Sarbanes-Oxley. As this trend continues, nonprofits may need to save database information as it is, instead of updating it on an ongoing basis.

Shared server architecture. Developing a shared server architecture will help SaaS 2.0 vendors increase the scalability of their applications and the number of clients connected to the database.

Security/Compliance

With an increasing number of nonprofit organizations falling victim to data breaches, security will become the hallmark of tomorrow's leading SaaS 2.0 vendors. For example, credit card numbers, tax forms and Social Security numbers were among the data exposed to intruders at a major public institution earlier this year. And the Washington Post went so far as to call 2005 "the year of the data breach."

Security is becoming one of the top priorities for nonprofit organizations, so it makes sense that software vendors follow suit. For example, the recent EDUCAUSE Current IT Issues Survey Report for 2006 determined that "Security and Identity Management" topped the list for the first time as the number one IT-related issue of strategic importance to participating institutions. In addition, the report found that "Security and Identity Management" is also the top issue expected to become even more significant next year. Software as a service providers that are not currently leading the industry with their security measures are already

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behind. Tomorrow's SaaS 2.0 vendors are today planning for — and even implementing — the necessary systems and procedures to provide state-of-the-art data security in the future.

Security measures to be considered with SaaS 2.0 include:

Consolidate log reports. The evolution to SaaS 2.0 will be accompanied by a transition from reactive to proactive security monitoring. A key element of proactive monitoring and analysis will be to consolidate log files into a single view in order to identify, manage, and counter security threats.

Dedicated security staff. SaaS 2.0 vendors that are serious about security will put their money where their mouth is, so to speak. It will become imperative for software as a service providers to maintain staff who are dedicated to security measures, such as alerts, vulnerabilities, and patches.

Host-based intrusion detection. While most existing security measures, such as firewalls, anti-virus and traditional intrusion detection systems (IDS), focus on securing the perimeter and monitoring activity from the outside in, hackers are now looking for new vulnerabilities. Successful SaaS 2.0 providers will need to utilize host-based IDS to determine misuse from inside the network, as well as breaches from the outside. In addition, host-based IDS can also verify the data integrity of important files and executables to ensure that SaaS systems are secure from the inside out.

Secure application code. As hackers seek out new vulnerabilities, software as a service providers will need to start securing the code within their applications — because that's the next area of exposure. Vendors haven't been building secure code into the application layer, but the evolution to SaaS 2.0 will mean that providers need to get smarter and more secure during application development. In fact, vendors should involve IT during the specification process and design to ensure measures such as tunneling and encryption are considered from the beginning.

Separate corporate and client infrastructure. Software as a service providers today may operate both their internal and external client systems using the same infrastructure. SaaS 2.0 best practices will dictate that client infrastructures be strictly partitioned — and possibly located at a different site — from a provider's corporate infrastructure.

SAS 70 compliant applications. Today's software as a service vendors are racing to demonstrate that their data centers are SAS 70 compliant. Moving forward, however, it will become increasingly important that the SaaS application itself be SAS 70 compliant, not just the third-party vendors used.

More detailed security precautions. SaaS 2.0 will necessitate additional layers and detailed information in the security process. For example, authentication processes will expand to include multiple layers such as biometric, peripheral, and token-based verification.

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— EDUCAUSE Current IT Issues
Survey Report, 2006

CONCLUSION

Software as a service has evolved considerably to provide the functionality and standards that are available to nonprofits today. But as software as a service evolves into the next generation, it will be entirely different drivers and requirements that lead nonprofits into partnerships with SaaS 2.0 vendors.



About Blackbaud

Blackbaud is the leading global provider of software and services designed specifically for nonprofit organizations, enabling them to improve operational efficiency, build strong relationships, and raise more money to support their missions. Approximately 19,000 organizations use one or more of Blackbaud products and services for fundraising, constituent relationship management, financial management, direct marketing, school administration, ticketing, business intelligence, website management, prospect research, consulting, and analytics. Since 1981, Blackbaud's sole focus and expertise has been partnering with nonprofits and providing them the solutions they need to make a difference in their local communities and worldwide. Headquartered in the United States, Blackbaud also has operations in Canada, the United Kingdom, and Australia.

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