A “SOFTWARE AS A SERVICE” PRIMER

Definitions, Perceptions, and Misperceptions

SaaS Definition

Simply defined, SaaS is an application delivery model in which the user accesses software over the Internet, from anywhere, at any time. (This is why the solution model is also called “on-demand” by some providers.)

The physical location and ownership/maintenance responsibility of the system that actually serves the software is outside the responsibility and concern of the end users.

SaaS is usually sold via subscription-based pricing, rather than the “perpetual license” that usually accompanies client/server software.

In true SaaS applications, all users run off a robust infrastructure and a single instance of the software (we’ll describe why this is important later in this paper).

Although this solution delivery model appears to be a relatively recent development, its roots go back more than a decade, as described in the sidebar. And like any new technology, SaaS has gone through several name changes and modifications.

Summary:

It’s hard to miss: the term Software as a Service (SaaS) is everywhere, garnering headlines in the technology press, leading to hot IPO’s raved about in the financial press, and generally being described as the future of software technology.

With this kind of press, virtually every major software vendor is touting some version of SaaS, leading to confusion about the solution model and its advantages.

This paper attempts to clear this haze by clearly defining the term, and describing the short-term and long-term benefits of the solution model and its variants.
SaaS Advantages

There are several obvious financial and resource usage advantages to the SaaS model, as compared to the traditional on-premises software model:

1. Initial Costs: with the subscription pricing model, the up-front investment in software licenses, OS licenses, databases, servers, backup equipment, etc. is eliminated. The service provider bears all of these costs, which are passed along in the subscription pricing.

2. Operations: because the service provider is operating the system, low-value but mission-critical IT operations are eliminated or reduced: nightly backups, tuning databases, defragging storage systems, applying security patches, etc., are all eliminated.

However, these advantages only begin to scratch the surface of the SaaS model. To understand the long-term strategic advantages of the SaaS model, we must first understand a few key points about how SaaS services are developed and delivered.

### A History of SaaS

**Mid/late 90’s:**
“Utility computing” becomes the theoretical darling of the technology press. Harking back to the old mainframe “time-sharing" model, this approach to corporate computing is based on the idea that “CPU cycles" are now a commodity, with storage and bandwidth rapidly approaching that mark.

**1999–2000:**
“Application service providers” or ASPs, become the new darling. In many cases, these were companies that took existing client/server applications and delivered them as services over a VPN or the Internet.

**2003:**
In the IT downturn of 2001–2003, ASP becomes a dirty word – many have gone out of business, leaving companies without their application or data. The new word is now “hosted.” Although technically this term simply means that the server is sitting in a third party data center, and is managed by someone else, it picks up steam and becomes widely associated with all variations on the software as a service model.

**2004:**
Salesforce.com goes public on NYSE, with its slogan “No Software”. The financial media picks up the drumbeat, and the term “software–as–a–service” gains widespread acceptance in the industry.

**2005–2006:**
Software–as–a–service solutions gain a strong foothold, with the conventional wisdom saying that the model best fits small and mid-sized companies. However, larger organizations are utilizing SaaS in surprisingly large numbers. A new generation of software–as–a–service companies begins to emerge, combining new software development methodologies (e.g., agile development, rapid application development) with the SaaS delivery model.

### Pricing Models

<table>
<thead>
<tr>
<th></th>
<th>CLIENT/SERVER</th>
<th>SAAS</th>
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<tbody>
<tr>
<td>Pricing Model</td>
<td>Perpetual Software License (Purchase)</td>
<td>Monthly subscription fee</td>
</tr>
<tr>
<td>Hardware</td>
<td>Customer Purchase</td>
<td>Included</td>
</tr>
<tr>
<td>OS Licenses</td>
<td>Customer Purchase</td>
<td>Included</td>
</tr>
<tr>
<td>Software Licenses</td>
<td>Customer Purchase</td>
<td>Included</td>
</tr>
<tr>
<td>User Access</td>
<td>Client installed on every PC</td>
<td>Web browser</td>
</tr>
<tr>
<td>Maintenance Fees</td>
<td>18-21% of software cost</td>
<td>Included</td>
</tr>
<tr>
<td>IT Operations</td>
<td>Customer must perform</td>
<td>Included</td>
</tr>
<tr>
<td>Upgrade Costs</td>
<td>One-time purchase</td>
<td>Included</td>
</tr>
</tbody>
</table>
SaaS Advantages

The Importance of Multi-Tenancy & Agile Development
True SaaS applications must be delivered from a “multi-tenant” system, which means that there is a single instance of the software running, and multiple companies use this system as if it were dedicated to their own use. Non-technical evaluators sometimes worry that their data may somehow “be mixed up with another company’s data”; however, modern database structures and security technology easily prevent this from happening.

More importantly, only multi-tenant systems can be combined with new software development models to deliver the long-term advantages of the SaaS model.

The most advanced SaaS providers do away with the traditional “waterfall” development schedule (version 1.0, 1.1, 2.0, etc.) in favor of an agile development methodology, or “rapid application development” methodology. Using these new software development techniques has two important distinctions for the users: they are NEVER faced with an upgrade (i.e., they are always using the most current version of the software); and they get direct access to the development team to ask for new features and customizations whenever they are need.

Even more importantly, these new features and customizations get automatically folded into the base application, so they are no longer “customizations”.

This combines the operational/financial advantages of SaaS with an entirely new set of advantages, most of them focused on the end users:

1. All users are on the same software, and it’s always the most current version.

2. Since custom feature requests are folded into the (one) base application, they are never obsoleted with the next upgrade, and instead they are carried forward as standard features. (NOTE: typically these new features are surrounded by configuration settings that turn off the new feature by default; it’s only when user asks for this new feature that it is enabled for a new company.)

3. Because users are talking directly to the developers, it’s easy to ask for new features or tweaks to interfaces.

The end result of this is that the underlying feature-set of a multi-tenant SaaS model gets better every day, and each new deployment of the software dramatically increases the features/functions of the software.

This is in direct contrast to more enterprise software models, where companies get frozen onto an obsolete release because of the heavy customization required to implement it in the first place.

Note that these advantages cannot be achieved with other variations of the SaaS model.

Finally, there are variations in how a SaaS application can be accessed.

1. In one model, client/server software is tweaked, allowing the client software to be installed locally and access the server over an Internet connection; in many of these applications, a web interface is added that allows a portion of the functionality to be accessed via a web browser. These applications are typically very bandwidth hungry, as they were originally designed for LANs instead of WANs.

2. A second model is for developers to enhance the functionality of a web browser with a plug-in or add-in software, providing an enhanced feature-set over what is available in a standard browser. While these applications use dramatically less bandwidth than the first case (above), there are security issues with downloads as plug-ins, as well as portability issues (e.g., accessing from a home PC).

3. In the “zero footprint” model, a SaaS application requires only a browser, with no plug-ins or downloads required. As browser functionality is improved, the potential functionality of these applications continues to increase, including features such as drag-and-drop.
The Dangers of SaaS “Pretenders”

As was stated above, virtually every software company in the market today is offering some type of service and calling it SaaS. However, a closer look at these offerings demonstrate that they do not offer the same advantages of a multi-tenant SaaS solution – and in many cases, have some of the same disadvantages of the legacy on-premises model.

The most common type of service that is mistakenly sold as SaaS is actually a hosted application. Application hosting is a widely available service that is useful in many circumstances. In a hosted application, a data center company provides a dedicated server and related hardware, network connectivity, rackspace, power and related services, and sometimes offers management services from the hardware to the OS and up through the application. In contrast to the multi-tenant SaaS solution model, this is a dedicated set of hardware that is being hosted and managed by a third party. The same IT operations are required as with an on-premises model (backups, applying patches, etc.), but these are now performed by a third party in an outsourced fashion rather than an internal IT department.

Application hosting may be advantageous for a company with limited IT resources, but hosting does not offer any of the long-term advantages of a multi-tenant SaaS solution. Because three parties are involved (customer, software vendor, hosting company) the costs are often higher than running a system internally – though often with guaranteed uptime and high quality IT services. Moreover, because each hosted application is an island unto itself, the model suffers the same challenges surrounding upgrades and customizations as the on-premises model.

<table>
<thead>
<tr>
<th></th>
<th>HOSTED</th>
<th>SAAS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pricing Model</strong></td>
<td>Purchase + monthly fee, or monthly subscription</td>
<td>Monthly subscription fee</td>
</tr>
<tr>
<td><strong>System Design</strong></td>
<td>Dedicated, hosted in 3rd party data center</td>
<td>Shared, multi-tenant model</td>
</tr>
<tr>
<td><strong>Hardware</strong></td>
<td>Depends on contract; sometimes customer must purchase, sometimes included in subscription fee</td>
<td>Included</td>
</tr>
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<td><strong>OS Licenses</strong></td>
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<td><strong>Software Licenses</strong></td>
<td>Depends on contract; sometimes customer must purchase, sometimes included in subscription fee</td>
<td>Included</td>
</tr>
<tr>
<td><strong>IT Operations: backups, patches, security, monitoring, etc.</strong></td>
<td>Included</td>
<td>Included</td>
</tr>
<tr>
<td><strong>Upgrades</strong></td>
<td>Depends on contract; sometimes customer must purchase, sometimes included in subscription fee</td>
<td>n/a – no upgrades required</td>
</tr>
<tr>
<td><strong>Systems design and development</strong></td>
<td>Performed as a one-off by hosting company</td>
<td>Not required</td>
</tr>
<tr>
<td><strong>Customizations</strong></td>
<td>One-off; not included in base application and NOT CARRIED FORWARD TO NEW RELEASES</td>
<td>Accomplished quickly, automatically integrated into base application</td>
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The 10 Myths of SaaS

As SaaS has become more widespread, a set of perceptions about SaaS have become accepted as “common knowledge.” The list below presents these assumptions, and provides data for judging their accuracy.

Myth #1: SaaS is only for small companies

Because the SaaS model was pioneered by startups in the software industry, early acceptance was widespread among small and midsize companies. However, according to research published by Saugatuck Research in March of 2007, “Large enterprises are now more likely than small companies to leverage SaaS in their core computing environments, even for business applications considered to be mission-critical.” According to Saugatuck, there are three drivers behind the adoption of SaaS by large enterprises: 1) The establishment and expansion of SaaS aggregation, development and integration platforms (SIPs) by leading vendors; 2) the increase in the number of SaaS environments certified with regard to their integrity based on such auditable standards as SAS-70; 3) increasing verticalization and specialization of SaaS solutions. In addition, 95% of IT executives at companies with 500 employees said they were satisfied with the SaaS programs they are using, up from the already high 84% at companies of all sizes.

Myth #2: The cost-advantage is only in the short-term; long-term, SaaS is more expensive

Total cost of ownership calculations are notoriously complex, with end results varying widely based on small changes to the assumptions used for the calculation. However, SaaS costs usually compare favorably to large organizations providing robust implementations of enterprise software, with regular upgrades and patches. SaaS costs may be less advantageous to a small or mid-size company that scrimps on its IT operations.

One area that is often overlooked in comparisons, however, is the time value of money. In essence, SaaS keeps cash in the hands of the customer longer, freeing it to be used for other critical operations. According to Bruce Guptill, managing director at Saugatuck Technology, “SaaS is a means to increase the capabilities of the company at a faster pace and at lower costs…. [companies] want to put money into growing,” rather than infrastructure.

Myth #3: Security is a concern with a SaaS application

According to IDC and Gartner Group, the two biggest threats to IT systems are not hacker attacks, but disgruntled employees and ex–employees with access to internal systems, and a lack of control for critical data.

The top SaaS providers, including Plexus Systems, undergo regular audits to the SAS-70 standard, an auditing standard developed by the American Institute of Certified Public Accountants (AICPA). An accredited SAS-70 audit is widely recognized as a vital benchmark in security measures, because it represents that a service organization has been through an in-depth audit of their controls over information technology and related processes.

Additionally, top SaaS providers typically have advanced biometric controls for access to the system infrastructure, advanced anti-hacking systems to record all attempts to access the system, and a dedicated security team that monitors these systems 24x7. In fact, the security measures employed by mission–critical SaaS providers are usually for more advanced than those used by Fortune 100 companies.

Myth #4: SaaS is only for group or departmental solutions, not for enterprise applications

Early SaaS offerings were generally targeted at small groups or departments within larger organizations, focusing on costly applications that had shown low ROI in the past, such as CRM. However, according to a report issued by Saugatuck Research in July of 2008, “SaaS is expanding well beyond its early low-cost, easy-to-deploy niche application roots to become an important business computing force that is fully integrated with broader enterprise architectures.”

In other words, SaaS has gone from point-solution curiosity to mission–critical applications for enterprises, because the benefits offered by the approach are being matched to enterprise-class applications, such as ERP.

Myth #5: It's impossible to integrate SaaS applications with my other systems

In direct contrast to the “science projects” required to integrate traditional on–premises applications, many SaaS applications utilize industry standards such as XML to easily swap data and integrate with other systems. For a software application with a well–documented API, integration with a SaaS solution may take a few days – or even a few hours – vs. the weeks and months required for traditional applications.
The 10 Myths of SaaS

Myth #6: Using a SaaS application gives me less control over my business and my data

When evaluating a SaaS application, some people fear a loss of control over their data, and in turn their business. In fact, quite the opposite is true.

The contracts and service level agreements utilized in conjunction with SaaS applications almost universally guarantee an organization the right to access and download its data at any time, and SaaS providers almost universally define ownership of data as belonging to their clients. Additionally, SaaS providers like Plexus Systems provide a flexibility in accessing, displaying and analyzing data that is difficult to replicate with legacy on-premise systems.

This combination of guaranteed ownership rights, flexibility of usage, and anytime/anywhere access give users MORE control over their data and businesses, not less.

Myth #7: Multi-tenant/single-tenant/virtual technology is not important

As described above, a multi-tenant architecture, combined with an agile development methodology, is the only SaaS solution that delivers long-term advantages beyond cost and resource use. Because a multi-tenant architecture removes the requirement of testing all software updates against multiple hardware/OS configurations, development of new features is greatly accelerated. This allows the SaaS provider to roll out new features upon request, rather than waiting until they can be bundled in the next software “upgrade”. In fact, with the multi-tenant model, there are no “upgrades” required; a single software installation is used by all users, and new features are automatically incorporated into this installation as they are delivered by the development team, rather than being relegated to a one-off “customization” that may not carry forward to the next major update. The single tenant or hosted model does not deliver any of the long-term promises of SaaS.

Myth #8: I can wait for my current software company to offer a SaaS solution

Major software providers have no incentive to launch a SaaS solution until they are forced to by market competition. In fact, many market forces are pushing these companies to NOT develop a SaaS solution: their sales channel is not optimized for SaaS, their financial model is dependent on large sales of perpetual software licenses, and if they are publicly traded, they may be punished by investors for changing their current business model.

When one of these legacy software vendors does finally make the decision to move to SaaS, it can take them two years or more to launch the first version of their SaaS solution – sometimes much longer. Moreover, for a traditional software company to transform itself from a product development company into a service organization is a major undertaking: think about the quality of service most customers receive from their current software vendors, and you’ll get an idea of the challenges facing these companies as they seek to transform themselves.

In summary, companies who choose to wait for their current software vendors to develop a SaaS offering have a long wait in front of them, and will be missing out on the financial and operational benefits that a SaaS solution provides.

Myth #9: SaaS reduces the authority and value of our IT department

To paraphrase Rodney Dangerfield, most IT departments “don’t get no respect.” The complexities of running sophisticated enterprise systems are lost on non-technical personnel, and so IT organizations suffer from the dreaded “C/F” syndrome. That is, when things are running well, their users grade them with an average “C” – after all, the systems are supposed to be running smoothly, right? And when things go wrong, the IT organization immediately gets graded an “F”, whether it’s their fault or not.

It’s no wonder that some IT professionals are defensive when it comes to anything that may impinge on their responsibilities. However, the IT professionals who have embraced the SaaS revolution are finding something surprising: SaaS empowers IT organizations in a way that traditional on-premises applications do not.

For IT professionals, installing and maintaining applications and systems are laborious, but relatively low value, responsibilities. When these responsibilities are removed by the use of a SaaS solution, IT professionals can find themselves freed to focus on adding value as business process professionals; that is, SaaS removes the humdrum portion of the IT department’s responsibilities, and focuses the team on adding value by focusing on business processes and operations, rather than maintaining hardware and installing patches.

For IT organizations that embrace this new role, the prestige and authority of the department can be much higher than with their previous role.
The 10 Myths of SaaS

Myth #10: SaaS might be a good interim strategy as I go through some major changes, but it’s not a long-term solution

Over the past few years, many companies undergoing a major business change (e.g., merger, acquisition, spinoff, etc.) have evaluated a SaaS solution as an interim option, until their new operational parameters are well-defined and they have the capabilities and budget available to do a large on-premises deployment. However, most of them have changed their minds after using the SaaS solution for a period of time, and have indefinitely tabled the long-term on-premises project.

This shouldn’t be surprising. According to research published by Saugatuck Research in July of 2008, customer satisfaction with SaaS applications far exceeds that of traditional enterprise software – a whopping 95% of customers are happy with their SaaS solution, while some other studies have measured satisfaction among on-premise software users at approximately half that. In fact, some studies have shown that traditional on-premises deployments of enterprise solutions such as CRM and ERP are considered failures a majority of the time. This is not true with SaaS solutions, where the renewal rate for enterprise SaaS providers remains above 90%.

The lesson: SaaS is a long-term solution that delivers superior customer satisfaction.

Plex Online: SaaS ERP and MES for Discrete Manufacturers

Plex Online, from Plex Systems, Inc. is a web-based, software as a service application that goes beyond the traditional categories of enterprise resource planning (ERP), manufacturing execution systems (MES), and supply chain management (SCM) to offer manufacturers everything they need to operate their businesses efficiently and profitably. Plex Online provides:

- Data capture at the point of origin (e.g., the plant floor and the loading dock), and data processing in real time, offering unparalleled visibility into your operations with up-to-the-minute accuracy.
- Industry-specific solutions for high-precision, high-liability manufacturers, including automotive, aerospace & defense, medical device, and packaged foods, where quality and traceability are absolute requirements.
- The flexibility to manage a single department, an entire plant, or a global enterprise.

Plex is the only company in the world to deliver a comprehensive software solution for manufacturers via the software as a service delivery model, speeding technology deployments, lowering costs, and delivering long-term value.