The impact of the SaaS model of software delivery

Chris Manford

cmanford@unitec.ac.nz

Abstract

This paper attempts to answer the question "Is the value proposition of the SaaS model for using computing applications sufficiently compelling, and if so what are the implication for IT professionals and educators of future IT professionals?"

SaaS solutions are similar in concept to bureaus where a particular software application is developed and managed by an external provider and made available to customers by subscription over the Web. SaaS solutions have been around for several years but recently they have been gaining in popularity. This paper looks at some popular SaaS solutions and compares them to equivalent in-house solutions. It then considers the implications on the need for IT professionals, and educators of future IT professionals, if SaaS usage became widespread.

 Keywords: Software as a Service, Industry trends, Computing education.

1   Introduction

This article considers the impact that Software as a Service (SaaS) is likely to have on the demand for IT professionals and the consequences for education providers who are preparing future IT professionals. Before it does this however it explains what SaaS is, and why it is likely to become an important force in the IT industry in future.

2   What is SaaS?

According to Wikipedia Software as a Service (SaaS) is a "software application delivery model where a software vendor develops a web-native software application and hosts and operates (either independently or through a third-party) the application for use by its customers over the Internet. Customers do not own the software but pay an ongoing fee for its use." (Wikipedia, 2008)

The SaaS first raised its head in the SIIA trends report 2000 (Software & Information Industry Association, 2000) replacing Application Service Providers (ASP) as the preferred term to describe this type of service delivery model.

Many people are already using service-based solutions perhaps without realising it. For example hosted Email, Skype, Goto Meeting and Microsoft Live Meeting can all be considered service-based applications. The SaaS model fits well with companies who either do not have an in-house industry expert or who prefer to focus on their Company's core competencies (Thanawala, 2008). By subscribing to a SaaS provider they can still utilise software applications to run their business and make use of SaaS subject experts without needing to set-up and manage a large, complex and costly in-house IT infrastructure.

3   Why is it important?

On May 13 2008 Google returned 84,800,000 hits on a search of SaaS, so there is quite a lot of interest in it.

People who have been around the IT industry for some years may think this delivery method seems familiar. In the past we've had Bureaus and more recently ASPs that, other than the technology used for service delivery, have similar business models. Indeed there are similarities between them, perhaps leading the sceptics to consider that SaaS is just more hype and nothing more than a rebranding of an old concept that didn't succeed in the past and will not succeed in the future.

Other commentators consider SaaS has "the potential to transform the way IT departments relate to and even think about their role as providers of computing services to the rest of the enterprise" (Carraro & Chong, 2006). Nigel Rayner from the Gartner Group suggests "Service-oriented architecture and software as a service are two of the biggest technology trends to affect business applications in recent years" (Rayner, 2008). In his comment on what's hot in 2008 industry analyst Phil Wainewright says "The coming year is going to be a pivotal one for anyone involved in software-as-a-service. For everyone else, it's going to be the year when SaaS becomes impossible to ignore" (Wainewright, 2008).

The best-known example of a SaaS provider is Salesforce.com. They have been in business for more than five years and have over 399,000 subscribers at 20,500 companies worldwide and growing at 80% a year (Business Week, 2006). The oldest and biggest provider is Automatic Data Processing (ADP) who have provided payroll services for nearly 60 years and in 2005 generated $8.5 billion in revenue from 590,000 subscribers worldwide (Business Week, 2006). The SIIA Channel White Paper (Software & Information Industry

Association, 2007) estimates that 10 million companies will be using SaaS in the next 5 to 10 years.

The reason for the popularity of SaaS is because it is providing a fundamentally different service to anything that preceded it. This is why it's different:

- Even though a particular application uses the same code base (to reduce maintenance costs) it can be configured to suit the needs to each of each subscriber.
- Rather than appealing to a horizontal market (e.g. a generic CRM system) the SaaS provider can target a vertical market (e.g. a CRM solution for real estate agents). This means that the application is much more likely to suit the needs of the customer and removes many of the traditional disadvantages to using packaged solutions.
- The SaaS provider takes responsibility for ensuring the application is relevant. For example when employment legislation changes the Workforce Guardian[1] SaaS provider will update the application to ensure it remains compliant. This reduces the burden on the subscriber to maintain in-house knowledge in the specialist area of employment law.
- The SaaS provider can add value to their offering. For example the Workforce Guardian site provides subscribers with advice and information about general HR matters and FAQs and case studies on employment matters.
- The SaaS subscriber can pay for the application from their operating budget without the need for a capital purchase and the budgeting problems that it entails.
- If the SaaS subscriber is no longer happy with their SaaS provider they can easily move to another.
- The SaaS provider does not need to worry about old versions of the application software running on client's sites, this simplifies maintenance and reduce their maintenance costs enabling them to pass these savings onto their subscribers.
- The support mechanism from the SaaS provider does not need to include support for configuration and installation problems or different version etc, it can concentrate on ensuring the customers gets the best out of the application.
- Some SaaS providers are offering a "try before you buy" option that is very suitable for companies who are hesitant to enter into a long-term commitment. (Schwartz, 2006)
- Flexible licencing arrangements such as weekly options can also mean that SaaS solutions can be used for short-duration or ad-hoc projects. (Schwartz, 2006)

---

[1] Workforce Guardian is a SaaS employment provider in Australia.

SaaS providers are moving beyond the traditional business applications and a recent provider Skytap Inc is offering virtual labs as a service. The service is targeted at software development companies that do not want the cost of maintaining many different versions and server configurations but they need these to test their software. Skytap can provide virtual servers with a variety of operating systems, databases, and applications running in a number of different languages. (Kanaracus, 2008)

4 The SaaS Software Architecture

SaaS business solutions are usually based on four core components:

1. Business Process Automation Tools
2. Document Management Systems
3. Collaboration Services
4. Integration Tools

SaaS Business Solution			
Business Process Automation Tools	Document Management Systems	Collaboration Services	Integration Tools

Figure 1 - Core components that underpin SaaS Business Solutions

SaaS providers will need to thoroughly understand these core technologies that underpin their business solution.

According to Microsoft (Carraro & Chong, 2006) SaaS applications have gone through the following stages of architectural development:

- Level 1 the traditional ASP model – each subscriber used their own customized version of the software application that was hosted by the provider.
- Level 2 single-tenanted applications – each subscriber used their own version of the software application that was hosted by the provider but not customized.
- Level 3 multi-tenanted applications – provider runs single instance of the application that serves every subscriber. All subscriber data shares same database but are separated logically. Configurable metadata is used to ensure unique user experience for each subscriber.
- Level 4 – same as level 3 but running on a server farm therefore scalable to an arbitrary number of subscribers.

The third and forth levels employ the most complex software and hardware architectures available. It has

only been comparatively recent that the technology has been available to reliably support these applications.

5 Summary of main features of SaaS their consequences & implications

Feature - Accessed via Web
Consequence - Ease of access
Implications - Anywhere, any time and any one can access the application, greater demand for web development skills.

Feature - No client-side software needed
Consequence - Reduced costs for subscriber: no installation costs, no software maintenance costs, no deployment costs, no server administration costs.
Implications - Lower total cost of ownership, reduced time-to-value, fewer IT staff needed by subscriber.

Feature - Pay by subscription based on usage
Consequence - suitable for SME market.
Implications - SMEs can gain access to more sophisticated applications, unsuitable for high volume or high usage applications.

Feature - SaaS server must support many subscribers
Consequence - application running on a server farm
Implications – scalability: as subscriber's usage grows the software performance will not degrade and increased complexity of infrastructure.

Feature - all subscriber data held on SaaS server
Consequence - very high level of security needed by SaaS provider in order to gain trust of subscribers and sophisticated multi-tenanted software architecture needed.
Implications - subscriber data distributed between many providers and must be integrated in order to gain overview of business, higher demand for system and data integrators.

6 What is the impact on the IT industry?

In a SaaS dominated world, IT professionals will be needed by both SaaS subscribers and providers.

SaaS subscribers will need people to help them select the best SaaS provider and to ensure the IT solution and business process are aligned. They will also need people to integrate the SaaS applications with each other and into the technical infrastructure of the company.

The SaaS provider will need staff to develop and help implement the SaaS solution. This will include business analysts who have an in-depth understanding of the particular vertical market that the SaaS serves, software developers to design, build and maintain the SaaS applications and people to ensure their server farm is secure and reliable.

The impact of these demands is likely to change the requirement for IT staff as follows:

- Reduce demand for software engineers as the new SaaS subscribers decide against developing bespoke software applications.
- Increase demand for software engineers with experience in designing and developing complex multi-tenanted applications suitable for SaaS delivery.
- Increase demand for system integrators.
- Increase in the level of specialisation by business analysts.

7 What are the implications for educators of future IT professionals?

Vocational educators need to teach the skills that are relevant for the next generation of IT professionals. From a SaaS perspective these skills can be grouped into two areas: the business area and the technical area.

People supporting the SaaS business area will need to be able to:

- Understand the business needs and processes of vertical markets that SaaS applications are likely to support. These areas should include business process applications, departmental applications, line of business applications and project based applications.
- Provide an overview of SaaS applications available.
- Understand how to configure SaaS applications.
- Apply business process modelling tools to complex business situations that involve task escalation and verification and other complex workflows.
- Achieve business goals by modelling and reengineering business processes including escalation and verification rules and other complex workflows to align them with the SaaS applications.
- Provide management with an overview of the business by using 2D and 3D graphical reporting tools that integrate data from a variety of sources and present the results visually.
- Plan, design and organize User Acceptance Testing (UAT)
- Negotiate and monitor service level agreements.
- Maintain her/his knowledge of the market to ensure the SaaS solution remains relevant including:
  - Current trends in best practice in the SaaS application areas.
  - Current laws and compliance requirements
- Apply best practice in the use of business tools including:
  - Business process automation tools such as K2 Black Pearl
  - Document management systems such as Windows SharePoint Services

- o Collaboration tools such as Live Meeting
- o Integration tools

People supporting the technical role will need to:

- Design technology frameworks for businesses that use Service Orientated Architectures (SOA).
- Integrate SaaS applications with existing bespoke applications and existing SOAs through the use of middleware and web services.
- Integrate SaaS applications into the company's desktop environment by writing and configuring web parts[2].
- Have a thorough understanding of multi-tenanted software architectures.
- Design and develop high quality, graphically rich, multi-tenanted, software applications that are capable of running over the Internet.
- Have significant experience developing web-based multi-tenanted business solutions.
- Ensure the delivery platform is stable, reliable and extremely secure. Set-up and maintain server farms that are very secure and reliable.

8   Future SaaS Development Platform

If vocational educators are to provide students with skills that will be needed by industry in three years time they need to look to the future. If I were asked to define requirements for the platform to support the development of SaaS applications, I would suggest that it must:

- support a graphically rich user interface beyond that currently available in HTML (e.g. multiple concurrent windows, drag and drop between windows),
- support the same application delivered via the Web, Desktop and Mobile devices,
- support communications between users (via a server),
- be network aware and able to work off-line or on-line,
- support push and pull technology from the client workstation,
- support Microsoft, Apple, Linux and mobile O/S,
- support HTML and Ajax and
- provide a licence-free runtime environment.

The development environment described here may seem futuristic but it is in fact available today but that is the subject of another article.

---

[2] This assumes that the most common desktop of the future will be based on Windows SharePoint Services (WSS) or a similar Web part integrator.

9   Conclusions

In this article I have tried to show that SaaS providers are in fact offering a service that is significantly different from anything that the IT industry has seen in the past and the result is a compelling value proposition for subscribers. This will ensure a strong uptake of these services. How strong remains to be seen. I've then looked at the IT industry and the skills required of IT graduates from vocational education providers who are expecting to enter the industry and I encourage providers to review their courses to ensure their graduates can contribute to the SaaS economy.

10   References

Business Week. (2006, April). *Business Week, Technology*. Retrieved May 13, 2008, from http://www.businessweek.com/technology/content/apr2006/tc20060417_996365.htm

Carraro, G., & Chong, F. (2006, October). *Software as a Service (SaaS): An Enterprise Perspective*. Retrieved April 28, 2008, from http://msdn2.microsoft.com/en-us/library/aa905332.aspx

Kanaracus, C. (2008, April). *Startup pushes virtual labs as a service*. Retrieved May 13, 2008, from Infoworld: http://www.infoworld.com/article/08/04/10/Startup-pushes-virtual-labs-as-a-service_1.html

Rayner, N. (2008, April). *The Impact of SOA and SaaS on Financial Systems*. Retrieved April 20, 2008, from Gartner Group: http://www.gartner.com/DisplayDocument?ref=g_search&id=655710&subref=simplesearch

Schwartz, E. (2006, July). *Software-as-a-service is maturing fast*. Retrieved May 13, 2008, from Computer World: http://www.computerworld.co.nz/news.nsf/spec/18232A41E37589C1CC2571AB0003EB2A

Software & Information Industry Association. (2000). *Building the Net: trends Report 2000, Trends Shaping the Digital Economy*. Retrieved May 13, 2008, from http://web.archive.org/web/20000815064749/www.trendsreport.net/software/1.html

Software & Information Industry Association. (2007, March). *Channels for the new SaaS Industry*. Retrieved May 13, 2008, from SIIA: www.siia.org/

Thanawala, M. (2008, Feb). *http://blogs.oracle.com/zen/*. Retrieved May 12, 2008, from Oracle: http://blogs.oracle.com/zen/

Wainewright, P. (2008, Jan). *Eight reasons SaaS will surge in 2008*. Retrieved April 20, 2008, from http://blogs.zdnet.com/SAAS/?p=432

Wikipedia. (2008, May). *Software as a service*. Retrieved May 10, 2008, from Wikipedia: http://en.wikipedia.org/wiki/SaaS