Current and Future State of the SaaS Business Models

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Summary: Based on the research conducted over numerous Web sources and white papers, the current article tries to give a short view on the current and future state of SaaS (Software as a Service) business models in industry.

The SaaS technology is presented regarding its definition and methods of implementation. The SaaS business models are outlined. Special attention is given to its relation to SOA (Service-Oriented Architecture) as a natural extension and enhancement of service provisioning. The different evolutional stages of SaaS development, application and usage are presented.

The major advantages of the SaaS business models are summarized regarding end users and service providers in relation with the financial value, new technologies and improved operations.

Tendencies for the future of the SaaS business models, development, their implementation by using new technologies, concerns and impact on the IT professionals are given.

Key words: SaaS (Software as a Service), SOA (Service-Oriented Architecture), Application Programming Interface (API), Software, Services, Applications, Business Models.

JEL: C6, C63, C8, C81, D8.

1. Introduction

Gartner, Inc. defines SaaS (Software as a Service) as software that is owned, delivered and managed remotely by one or more providers [4]. The popularity of the on-demand deployment model has increased significantly within the last four years. Initial concerns over security, response time and service availability have diminished for many organizations as SaaS business and computing models have matured and adoption has become widely penetrating.

Under the SaaS model a vendor is responsible for the creation, updating, and maintenance of software [3, 7, 8, 13, 15]. Customers buy a subscription to access it, which includes a separate license or slot for each user of the software. The SaaS model can add efficiency and cost savings for the both the vendor and customer. Customers save time and money since they do not have to install and maintain programs. The customers do not have to hire or use existing staff to maintain the software. They do not have to buy any new hardware. This allows a customer to focus more resources on expanding his business. Shifting the burden of software hosting and development to the vendor can also speed up the time for the customer to obtain a return on the software investment. Using the SaaS model, the number of slots can be increased as the business grows. This is usually faster and cheaper than purchasing another license and adding to another computer as in the case with traditional software. Vendors usually only have to update and maintain the software on the network,

versus updating different copies of the software on different computers. This allows the vendor to provide the latest updates and technology to each customer in a timely manner. The drawback for the customer is that he does not control the software and the customization of programs may be limited.

According to Gartner the worldwide SaaS revenue in the enterprise application markets was to surpass $6.4 billion in 2008, a 27 per cent increase from 2007 revenue of $5.1 billion [4]. The market is expected to more than double with SaaS revenue reaching $14.8 billion in 2012. Gartner analysts predics the adoption of SaaS is growing and evolving within the enterprise application markets, popularity increases, and interest for platform as a service grows.

There is a growing spread of SaaS vendors, the major ones of which are Salesforce.com, Google, Amazon, Apple, Microsoft, IBM, etc.

2. SaaS Definition

SaaS (Software as a Service) is a new technique in the software technology field. SaaS represents a method for software delivery that allows access to software and its functions from a remote place through web based services [11, 14]. SaaS is a software distribution model in which vendors or service providers host the applications in order to make them available to their customers through a network, usually the Internet. SaaS is an on-demand software service provided by the vendors to its consumers. The licensing for application usage may be with a single user or it can be shared with multiple users. The user license terminates as soon as the purpose of a certain application software is ended, thus eliminating unnecessary expenditure in the future. SaaS eliminates the need for a given organization to deal with the set-up, installation and daily maintenance

of the software. SaaS is effective in reducing the costs of business solutions as it provides the organization with access to business functionality at a cost normally far cheaper than a licensed application fee which is possible due to its monthly fees based revenue model. In this way it facilitates the cost prediction over a determined period and allows companies to focus on providing their customers with its core services and products.

3. SaaS Implementation

SaaS architecture is classified as being a part of 1 of the 4 "maturity levels," as per the Microsoft [1, 11] . The key attributes of the application are configurability, scalability and multi-tenant efficiency. The four levels are distinguished from each other by this attributes. As each level has one of the three attributes:

• Level 1 – The Ad-Hoc/Custom: In this level, each and every customer is equipped with its own modified version of a hosted application. Each of them is solely responsible to run their own instances of an application on the servers of the host. This being the primary maturity level, the effort required by the SaaS to transfer the non-networked in this level for the development is minimal and the operating cost is even reduced. The reduction is primarily due to consolidation of server hardware and administration.
• Level 2 – Configurable: When it comes to the 2nd maturity level, the flexibility with which programming is performd is quite greater. As in this level, the user is provided with the metadata which is configurable by him and this enables many customers to use separate cases of similar application codes. In this manner various needs of the customers can easily be met by the vendor and they can even provide the customer with the detailed configuration options. Maintenance and updating of the common code bases are made easy and simple for the users.

• Level 3 – Configurable and Multi-Tenant-Efficient: In this level, another attributes are taken care of, but it lacks scalability. Adding of this attribute makes way for the single program instance for serves each customer. This enables the serves resources to be used to maximum.

• Level 4 – Scalable, Configurable and Multi-Tenant-Efficient: This is the final maturity level and it has the benefits of all the key attributes. Scalability, which was missing in the third level, is added up through the multi-tier architecture. In this manner it provides a complete balance farm of the identical application cases, which are running on the variable count of servers. The capacity of the system can be varied according to the demand by simply either by adding or taking away servers. No changes have to be made in application software architecture.

Virtualization is one more key attribute, which may be used in SaaS architectures instead of multi-tenant attribute or together with it. The advantage of adding virtualization over multi-tenant application in the architecture is that the system's capacity can be increased with no further programming. If both are present, then it would provide greater flexibility for tuning the system for best performance.

SaaS software takes advantage of the well established Service Oriented Architecture. This will facilitate software applications for communicating with one another. Each software service can act as a service provider, exposing its functionality to other applications via public brokers, and can also act as a service requester, incorporating data and functionality from other services. Today Service Oriented Architectures and the Application Programming Interfaces of web services are standards for the most SaaS providers, making integration with on-premise vendor software and home-grown systems considerably easier. SaaS definitely extends certain benefits from the SOA application [5, 9]:

• **Wrapping Existing Components for Reuse** – When re-architecting existing systems or applications for delivery as a service, SOA can provide an excellent approach to wrapping existing components for re-use. This approach allows the system developers to design from scratch using SOA techniques, followed by wrapping the existing system components as services.

• **Programmatic Access to Services** – Customers are allowed to access their information programmatically through web-services. Usually this approach is implemented by APIs, allowing customers to programmatically access and control their information within the corresponding service. SOA provides an excellent design approach for SaaS developers to use in determining which services to expose, how to define their boundaries and how to implement them.

• **Flexibility and Reuse** – SOA offers SaaS developers an approach to software architecture that provides maximum flexibility and opportunity for reuse in regard to the rapidly changing requirements of their customers and markets.

• **Migration between SaaS Providers** – One of the key benefits to customers of exposing access to data through web services based on SOA is that of data portability. SaaS vendors that offer customers access to their data through web-services will also face the possible challenge that customers can easily extract and migrate their data to another SaaS provider.

• **Service Integration across Multiple Services** – An evolving benefit to customers of exposing access to data through web services is that of service integration across multiple SaaS vendors. As individual SaaS vendors expose web services, an opportunity is created to integrate across vendors, allowing one vendor to integrate with another at the request of the customer.

• **Business Process Management** – the use of SOA and Web-Services within SaaS will create the opportunity to implement Business Process Management (BPM) as a service. BPM

offerings will allow business users to customize the applications to meet their specific business requirements by defining their those business processes and enforcing business process rules across multiple SaaS offerings.

The SaaS business models has evolved significantly since its origin and goes through several stages (waves) [6, 10]:

SaaS 1.0 – Wave I (2001- 2006) – **Cost-Effective Software Delivery**. It reflects the SaaS early adoption (very low) and is characterized by:

• Stand-alone applications
• Multi-Tenancy
• Limited Configurability
• Focus on rapid deployment.

SaaS 2.0 – Wave II (2005-2010) – **Integrated Business Solutions**. It reflects the Mainstream SaaS stage of adoption (low) and is characterized by:

• Integration with Business
• SaaS Integration Platforms
• Business Marketplaces and SaaS Ecosystems
• Customized Capability
• Focus on Integration

SaaS 2.0 – Wave III (2008-2013) – **Workflow-Enabled Business Transformation**. It reflects the Ubiquitous SaaS stage of adoption (mid) and is characterized by:

• Focus on Business Transformation
• ISV to SaaS Enablement
• Server and Application Virtualization
• SaaS Development Platforms
• Public Cloud Infrastructure
• Customized, Personalized Workflow

Cloud Computing – Wave IV (2011-2016) – **Measured, Monitored and Managed Business Processes**. It reflects the Post-SaaS stage of adoption (low-high) and is characterized by:

• End-to-End Cloud Business Processes
• Intelligent Hubs Linking Platforms
• Virtualization on Mobile Devices
• Elastic Cloud Infrastructure
• Standards for Workload Portability
• Service Level Agreements for Composite Service Offerings
• Support at Business Process Level

4. SaaS major advantages

The numerous SaaS major advantages can be summarized regarding companies, end users and service providers in relation with miscellaneous indices such as financial value, new technologies and improved operations [5, 10, 12].

For companies and end customers – Minimum investments. Concerning the cost, the products through SaaS model do not require neither new servers nor installation from the side of clients nor access to any special network or support equipment. The only requirement is the access through Internet for all companies.

• Zero cost of deployment.
• Zero cost of update and the platform administration.
• Simple access to product trial versions.
• Payment according to the use.
• The SaaS solutions, since are different from other systems, are entirely accessible from any place and do not depend on the client's platform.
• Focus in the core of the Business. Concentrating on creating the externalized expertise of services. This may be one of the major advantages provided by this model.

For the providers – Expansion of the objective market. The size and location now are not that important.

• The cost of deployment distributes to numerous clients. It is possible to apply the virtualized solution to optimize the cost and share the resources.

• The updating and error resolving will be carrying out in a massive, fast and simple way.

• Easier maintenance product versions. All users use the same version.

• Flexible turnover method. At a commercial level SaaS demands to offer different services depending on the business type.

• Periodical income and consequently predicted results.

• Accelerate the sales process. The time of discovering one client and start the business relationship can be reduced to minimum. There is no need of preliminary installation.

• Software piracy elimination.

SaaS offers certain business advantages to small and midsized businesses that other potential solutions do not allow regarding financial value, adoption of new technologies and improved operations.

Financial Value is measured by Time to Value and Affordability.

• **Time to Value** – SaaS is quickly installed and made part of the work process when compared with on-premise software. Often it is possible to obtain a trial SaaS solution to get a feel for the way it looks, feels and operates. Once licensed a SaaS purchaser is available it takes a couple of days to be in full operational mode in comparison with traditional vendor software where it takes usually a much longer period. Thus the SaaS purchaser can begin to realize the business benefits earlier. The payback period is much quicker and the Return of Investment (ROI) is significantly better than with vendor software.

• **Affordability** – SaaS does not require large initial investments in comparison with on-premise software. Small and midsized businesses with limited capital budgets and limited IT support will find SaaS is far more suitable to their needs than vendor software.

New Technologies are implemented by a continuous innovation – SaaS solutions can be enhanced on a regular and almost continuous basis instead of mandatory yearly upgrades and major releases may also appear annually. The multi-tenancy technology allows for a such continuous stream of enhancements. SaaS users do not have to care whether a new release or upgrade will malfunction their system or cause a significant delay in parallel testing prior to switching over into full production. The SaaS provider assumes this responsibility behind the scenes and without intrusiveness.

Improved Operations are performed by customization, integration, reducing technical resources and shifting the focus on core competencies:

• **Customization** – It is easy to adapt SaaS solutions to fit the needs of small and midsized businesses. Some SaaS solutions exploit multi-tenancy to enable customization by programmers or system integrators. Other SaaS solutions target end users with easy-to-use configuration capabilities that allow non-programmers to easily modify their look-and-feel or their business processes. For many small and midsized businesses, configuration may be a more appropriate approach, due to its simplicity and lower cost since no programming is required.

• **Integration** – The integration support was first designed for the business partners of SaaS providers, whose complementary solutions were enabled to drop in seamlessly as though part of the original SaaS solution. The APIs of Web services enabled this integration and their purpose was to address the needs of SaaS customers with on-premise applications that had to integrate with the SaaS provider's solution.

• **Reducing Technical Resources** – Possibly one of the least-anticipated SaaS benefits is that it requires significantly fewer technical resources to manage than on-premise software, reducing the strain on IT organizations. This is a significant advantage for the small and midsized business. At the same time the utilization of the SaaS provider expertise, which possesses modern data centers and technology at its disposal, the small and midsized business can take advantage of the latest leading-edge technologies, including Web 2.0 and collaboration capabilities that might otherwise be hard to obtain. Thus the small and midsized business can obtain access to next-generation technology without having to manage it.

• **Focus** – Without the distraction of managing the specific IT functions (hardware, software, networks and technicians) the small and midsized company will be freed up to focus on its core competencies. SaaS is a way of outsourcing the cumbersome aspects of the essential IT systems that the small and midsized company needs to run its business and manage the challenges of growth, regulation and competition.

5. Tendencies for the future of the SaaS business models

SaaS is a relatively very new technology that is in progress and enhancement. Analysts predict its future development in the following major directions [2, 4, 6, 7, 10]:

• **SaaS will continue to grow in acceptance and prevalence in the marketplace but with time will shift to Cloud Computing**. Many analysts predict the continued growth in 2010 of SaaS as a business model for software vendors and a positive direction for software users but in near future it will be gradually replaced with the technologies and applications of the Cloud Computing model.

• **Real business value in SaaS will continue to improve, be better understood and**

measured more explicitly. There is a growing understanding of the difference between a standard onsite-based application and a service implementation that has been designed for the SaaS delivery medium.

• **Service ecosystems will be on the rise**. The economics of SaaS and efficiencies of modern development cannot really be leveraged without a good-sized market. Whether a specific service can be sold to a wider market or not then – it is wise to consider an ecosystem approach, since ecosystems will bring together a broad range of services.

• **New services will focus on their roadmap**. In the SaaS initial period one of the big obstacles of service implementation was all the decisions that had to be made and all the business operational aspects to be handled in order to meet the requirements and start development. Nowadays there is a wide array of mature, tested services that can be easily integrated into a service product to provide standard approaches to operations, integration, sales and many other business and technical requirements so the main focus is shifted to efficient development regarding the real value of a service.

• **Integration requirements will drive standards for service-based communication and interaction**. There is a clear need standards for integration and service-to-service interaction to be recognized. With the help of an extensible SOA, open APIs and standard integration tools, online services will offer ways to leverage local data, applications and other online services in ways that are ultimately much cheaper and more reliable than traditional custom integration services.

• **End-user clients and platforms will continue to evolve and increase in their importance and differentiation**. The merging products will be more mobile and connected and less bound to the most common operating systems. With the advent of applications like Google Chrome, the Chrome OS, Android, and the increasing number of application offerings

for the various smartphone OS platforms, the growth will not slow down in the near future. The best way is implement planned deployments for different platforms.

• **Customer collaboration will become a more integrated and critical part of product management and business operations**. All major aspects of SaaS product operations, such as product management, marketing and support, will move toward a closer collaboration with their corresponding user base and it is expected this tendency to be continued and to become accepted as standard practice among vendors. Integration of collaboration tools and services into the applications as part of the operations will grow significantly in the coming years.

• **There will be a growing awareness of the requirements and responsibilities implied by mature services**. Since online services become more accepted and critical to their customers, they will have to be more reliable, secure and scalable. There will be a growing number of options that will allow vendors to adopt the best environments and platforms on a pay-as-you-go model and avoid the high cost of initial investment.

IT professionals will be needed by both SaaS subscribers and providers [5, 12]. 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 to change the requirement for IT staff in the following way:

• Reduced demand for software engineers as the new SaaS subscribers decide against developing special software applications.

• Increased demand for software engineers with experience in designing and developing complex multi-tenanted applications suitable for SaaS delivery.
• Increased demand for system integrators.
• Increase in the level of specialization by business analysts.

6. Conclusion

SaaS (Software as a Service) is a model for acquiring, using and paying for business functionality. Its best-known characteristics are its relative speed to implementation and low initial costs for acquisition and deployment. As a result SaaS is widely adopted for a variety of business and IT functions. There are special business advantages of SaaS for enterprise business applications and SaaS can deliver tremendous value to small and midsized businesses. The advantages of the SaaS business model are targeted to improving business operations and to better fulfillment the challenges of growth and faced by small and midsize businesses.

Some of the key industry trends that contribute to the rapid growth of SaaS globally include examining ways to reduce IT capital expenditure budget, the increased availability of broadband which extends the viability of Web-based service solutions globally and the demand to implement software rapidly which supports a specific business need.

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