Chapter 3
Software as a Service (SaaS)

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ABSTRACT
SaaS, short for Software-as-a-Service, is quickly becoming the dominant approach for software delivery as a Web-based service. It is a software deployment model in which an enterprise application is delivered and managed as a service by a software vendor to simultaneously meet the needs of multiple customers. By enabling remote access to software and its associated functions, SaaS allows organizations and individuals to access business and commercial functionality at a cost typically less than paying for licensed applications. The purpose of this chapter is to discuss the origin and evolution of SaaS, as well as to describe its roll in today’s enterprise environment. This chapter begins with a description of the evolution of SaaS, followed by the architecture, implementation, and associated business model.

INTRODUCTION
SaaS is considered both a business model and application delivery model. As such, it encompasses a wide array of business, marketing and technical opportunities, issues, and challenges. The flexibility of SaaS implementations also means organizations can be charged on a Pay-as-you-go basis. One of the key benefits of SaaS, is that since it is a hosted application, users do not need to invest in costly hardware. In general, it removes the need for organizations to handle installation, set-up and the daily maintenance of servers and software. An aggregator may also bundle software by several providers in order to provide customers with a broad range of services that provide significant value to those with specific needs. This chapter will discuss the evolution of SaaS with considerations given to the independent software vendor and the various methods of delivery. The architecture from which SaaS is derived is then discussed, followed by its present architecture. This chapter also discusses the process of implementing a SaaS model as well as the associated business model.

DOI: 10.4018/978-1-4666-2187-9.ch003
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BACKGROUND

SaaS is a technological invention dating back to the 1990s that initially went unnoticed due to the rapid adoption of web services that was taking place during that time. Software applications during this period mainly operated in isolation on a single machine. Internet connections had very low bandwidths in the 1990s, which severely limited the adoption of software delivery over the Internet. The subscription approach to software delivery was later employed to provide software services to multiple systems without requiring the users to purchase and maintain locally installed applications. Even though SaaS implementations were becoming more prevalent in the late 90s, it was still impractical due to old prevailing web technologies and limits in data communication technologies. Furthermore, major software vendors like Microsoft and Oracle did not view SaaS as a reliable alternative for mission critical services. Thus, SaaS found its use in practical small-medium markets, where it was employed as a solution to software problems of limited scope. When larger vendors like Salesforce and Netsuite began to show interest in the subscription model of SaaS, its popularity began to improve significantly. Businesses quickly learned that SaaS afforded them the liberty to access entire system services or subscribe to only the essential ones. Other reasons why SaaS started to be widely adopted include:

1. Higher internet bandwidth and restructuring of data networks
2. Internet speeds increased exponentially, thus reducing SaaS latency
3. Internet became more affordable
4. Businesses possessed significantly higher bandwidths

Furthermore, as people became more comfortable with conducting just about everything online, the SaaS model became more familiar. Initially software vendors found it hard to accept the subscription model commonly employed by SaaS vendors. However, as the number of internet subscribers exploded in the early millennium, vendors began to realize the untapped potential of recurring revenue with relatively low overhead offered by the subscription based SaaS model (Menken, 2008; 2010).

Today, the typical method by which customers access a SaaS application is through a Web browser or a thin client over the Internet. If any customization capabilities are provided, they are generally available to all customers in a consistent manner. While this presents obvious benefits to the customer, such as ongoing support and upgrades, there is also significant benefit to the independent software vendor. From the perspective of the vendor, this model inherently provides strong protection of intellectual property, while offering strict control of the software-operating environment. In addition, the SaaS model generally provides a repeatable revenue stream from the service subscription fees. Furthermore, while software vendors may have various applications with varying capabilities, it is generally not necessary to have unique instances of applications for each customer who has special needs. Often, all that’s necessary is a single SaaS application instance that can support many unique customers. This concept, called multi-tenancy, is discussed in more depth further in the chapter. These characteristics of the SaaS model make it a ubiquitous network-based solution, which is perfectly suited to serve the needs of a highly dispersed workforce (Menken, 2008; 2010).

THE FOUR WAVES OF SaaS

While many concepts have been used to describe the emergence and future of the SaaS model, the most enduring one is the Four Waves concept. Understanding this concept may help software vendors who are considering moving an existing application service provider (ASP) or client-server
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