HealthManagement
Promoting Management and Leadership

Volume 4 / Issue 4 / 2009 - Features

Cloud Computing: Hiye or Hope

Author

E.Sujithis

an Industry Analyst,

Frost & Sullivan,

Healthcare EIA

Will it Rain Benefits for Healthcare Organisations?

It has been more than 40 years since the Internet was invented. Over the years there has been an exponential increase in the amount of information and complexity of IT infrastructure. This is the era of supercomputing with usage widespread from universities and healthcare organisations to life sciences companies and governments worldwide. There has been constant pursuance across the globe to use computing powers to the fullest. A product of those efforts is the concept of cloud computing.

The power of computing, measured in terms of tens of trillions of computations per second, is now applied to delivering personalised medical information, computational chemistry and biology over the web. With increasing demand for quality and cost efficient healthcare services for a growing range of patients the need to adopt an innovative computing model such as cloud computing has risen.

The idea behind the concept is to network large groups of servers that have low cost PC configuration to do distributed data processing activities across the network using specialised connections. Cloud computing would help in providing access servers, software, data centre and a networking platform. The industry has been always uncertain whether they need software that is located centrally or have software that resides on the user's system. With the development of high speed networks on one end and highly sophisticated, ever evolving, economical server technology on the other, the computing capabilities are being shifted to data centres. Cloud computing is quite similar to grid computing but a hybrid, more powerful and safer computing arena. While grid computing involves dividing large tasks into smaller tasks and running those in a number of parallel systems, cloud computing architecture is a collection of resources which are managed dynamically and can be provisioned, de-provisioned, monitored and maintained at any point of time. Cloud computing can in fact be defined as a set of virtual servers working in tandem over the internet.

In cloud computing IT services can delivered over the web to perform trillions of computations per second and it can considered as a blend of Software as a Service (SaaS) and Infrastructure as a Service (IaaS). In the recent times European healthcare IT vendors have evolved to provide Software as a Service as a cost efficient model for software delivery. However, cloud computing could now be seen as a next generation model of providing IT Services. In a scenario where healthcare providers are looking at automating processes at lower cost with higher gains, cloud computing can provide an ideal platform. Instead of an SaaS-style subscription model (SaaS) for applications, cloud computing vendors provide both infrastructure and applications as a service on a pay-per-use model.

Cloud computing could be seen as a boon to healthcare IT services as a number of hospitals could share infrastructure with vast number of systems linked together and reduce operational costs but increase efficiency. This also means realtime availability of patient information for doctors, nursing staff and other support services not within the country but possibly across various countries as medical professionals can access patient information from any internet enabled device without installing any software.

For instance, in the cloud computing setting, the EMR software or the CPOE software and information are located in the central server and not on the users or computer. Patient information and data can be accessed globally and resources can be shared by a group of hospitals rather than each hospital having a separate IT infrastructure. The use of cloud computing architecture helps is in eliminating the time and effort required to roll a healthcare IT application in a hospital.

Benefits to Healthcare Organisations

Cloud computing would help hospitals to achieve more efficient use of their hardware and software and increase profitability by improving resource utilisation to the maximum. By pooling the various healthcare IT resources into large clouds, resources are delivered only when they are required.

© For personal and private use only. Reproduction must be permitted by the copyright holder. Email to copyright@mindbyte.eu.

While adopting a healthcare IT application such as Electronic Health Records or any other clinical information system, the hospitals need to invest heavily on servers and applications. In the long run, these have to be constantly upgraded or replaced by the latest configuration, resulting in additional expenditure. A cloud computing architecture avoids such investments. The cost saving advantage of cloud computing can be experienced over a period of time with more users signing up. It can be considered as an economical model for managing overhead cost as software licenses, data storage and infrastructure upgrades. In addition, the healthcare IT vendor can place the infrastructure in any part of the world, including geographies such as India, Africa, Brazil and China, where overheads are lesser. This in turn would benefit the hospitals, operationally and economically and is an ideal model for business continuity and disaster recovery.

The hospitals would be in greater control over the service provided by the vendor. They would have greater freedom and flexibility to end the contract whenever they want if the quality parameters are not meet.

One of the most significant benefits of cloud computing is that it provides a scalable architecture for the hospitals to continuously add applications which may run on the cloud architecture and as well expand in terms of infrastructure.

Cloud computing costs are dependent on the usage of IT resources by hospitals. The service provider can provide a detailed cost break up and this can help hospitals control costs.

Clouds Which are Most Suited for Healthcare Organisations

There is lot of importance given to patient data security and privacy across Europe. Considering this aspect, Private Cloud would be most suited for hospitals, which are based on internal networks. Using a private cloud the hospitals can maintain a secure computing environment for its doctors, nurses, pharmacist, radiologist and patients. The main advantage of being on a private cloud is that the hospital has a greater control on the overall information processing systems and processes. Private clouds are most suited for large hospitals and large hospital groups, which would gain from the flexible computing environment, quality of service and advanced security.

The majority of medium sized and large hospitals would prefer a combination of in-house and external IT resources. Thus Hybrid Cloud would be the most preferred type of cloud among such organisations. Since the hybrid cloud is a mix of private and public clouds, it would allow a healthcare IT manager to switch applications back and forth between the clouds. Hybrid clouds provide a high level of interoperability and meet the dynamic data requirements of hospitals.

Issues and Challenges of Cloud Computing in Healthcare

One of the major concerns over cloud computing in healthcare is jurisdiction and access to patient data. Firstly, the companies providing cloud computing services to a European hospital may have their servers located in another part of the world.

This could raise issues in applying European data protection laws to the country in which the server resides. Even though there are regulations such as safe harbour programmes, to comply with, it is not considered as a possible solution. In addition, there should be a clear definition of the set of users across the cloud who could access patient data. Currently, there are no clearly defined views or laws for sharing patient data across the clouds and access to patient data in a cloud architecture. This is a key challenge that must be overcome in order to create a wider level of adoption among European hospitals.

IT vendors, who provide cloud computing services, must ensure maximum security for sensitive patient data and also guarantee this to hospitals and IT managers. To address the highly dynamic healthcare data environment and constantly changing IT requirements, cloud architecture is extremely appropriate. However, these services should not jeopardise patient data security. It is also the responsibility of the hospital that adopts the cloud computing services, to assure the patients and regulators that patient data is protected and all processes comply with European privacy laws.

In addition to the above, another major challenge for cloud computing service providers is the accountability of patient information and the need to constantly audit all processes and systems, to ensure their compliance with the European Laws and Regulations.

Constant Evolution

Cloud computing capabilities have evolved over the last couple of years in areas such as application programming interface (API), computing, storage etc. The capabilities of cloud computing service offerings have also developed along these lines. However, infrastructure capabilities still have a long way to go. Currently there no clear cut level of standards for cloud computing offering and this is another hurdle which has to be overcome.

Healthcare IT vendors need to evolve and introduce cloud computing infrastructure as it would prove a cost efficient model for automating

© For personal and private use only. Reproduction must be permitted by the copyright holder. Email to copyright@mindbyte.eu.

hospitals, managing real-time workload, reducing IT complexity and introducing innovative solutions and updates. The versatile architecture makes it possible to launch web 2.0 applications quickly and also upgrade healthcare IT applications easily, when required. With hospitals across Europe cutting costs, there is a clear need for innovative solutions, which can be easily implemented and maintained. A cloud computing architecture can help healthcare IT vendors prioritise innovation of their applications, while reducing the implementation time of healthcare IT solutions. The automated framework of cloud computing would provide increasingly cheaper and innovative services.

Recently, Microsoft Corporation, with their Health Vault, has partnered with Kaiser Permanente in the United States. Google Health has partnered with The Cleveland Clinic to provide cloud computing services.

The adoption of cloud computing would help standardise the infrastructure for healthcare IT solutions, in what is now a highly heterogeneous environment. In addition, vendors get to specify the kind of infrastructure and leverage the implementation to its best. Since a lot of hardware servers are virtualised, the installation and maintenance costs are tremendously reduced. Vendors could also offer the hospitals, the option of pay by use of resources in CPU hours, or gigabits consumed and transferred, which would be easily affordable.

Given its pay-per-use foundations, cloud computing helps hospitals hesitant to sign long-term healthcare IT services contracts. At the same time, the clouds can support almost any type of healthcare IT application which a hospital might want to implement as long as it does not require any specialised or customised hardware. Applications such Electronic Medical Records (EMR), Computerised Physician Order Entry (CPOE) systems, e-prescribing solutions, financial and administrative systems etc., can run on cloud architecture.

In a highly competitive healthcare market, it is important to healthcare IT vendors and hospitals to adopt innovative solutions, in order to reduce cost and increase efficiency. Cloud computing would help in enhancing capabilities and provide tremendous value, through efficient use of software and hardware investments. This kind of infrastructure drives profitability by improving resources utilisation and increasing their scalability. Though only a few companies such as Microsoft and Google are now dabbling in cloud computing technology, many other players are expected to join the bandwagon, given its long-term potential.

In brief, there is tremendous potential for cloud computing infrastructure in the healthcare industry and it could be an ideal tool to leverage computing power at low cost.

Published on : Sat, 4 Apr 2009

© For personal and private use only. Reproduction must be permitted by the copyright holder. Email to copyright@mindbyte.eu.