1.0 Introduction

The rapid growth of the Internet and the high availability of the reliable networking infrastructure brought the concept of cloud computing and it opens a new era of computing experience.

Almost all the services we enjoy in the Internet are cloud services such as Internet emails, Social networks, File Sharing and much more. Cloud service are not only software, they cover the infrastructure services and platform services too.

The applicability of the above concept in Sri Lankan context is something really interesting to discuss as the cultural and social factor influencing the decisions other than most critical technology infrastructure feasibility of the country.

Cloud computing marks the next contribution that software and computing technologies will make toward greater productivity and expanded economic growth. In small and large enterprises, as well as government offices around the world, Cloud computing provides initiatives that countries can and should take to ensure that they reap the full economic and growth benefits.

Below analysis is to elaborate the current position of the cloud computing in international as well as SriLanken Context.

1. Overview of Cloud computing

Cloud computing is the delivery of computing and storage capacity as a service to a heterogeneous community of end-recipients. The name comes from the use of a cloud-shaped symbol as an abstraction for the complex infrastructure it contains in system diagrams. Cloud computing entrusts services with a user's data, software and computation over a network.

There are three types of cloud computing

- Infrastructure as a Service (IaaS),
- Platform as a Service (PaaS),
- Software as a Service (SaaS).

Using Infrastructure as a Service, users rent use of servers (as many as needed during the rental period) provided by one or more cloud providers. Using Platform as a Service, users rent use of servers and the system software to use in them. Using Software as a Service, users also rent application software and databases. The cloud providers manage the infrastructure and platforms on which the applications run.

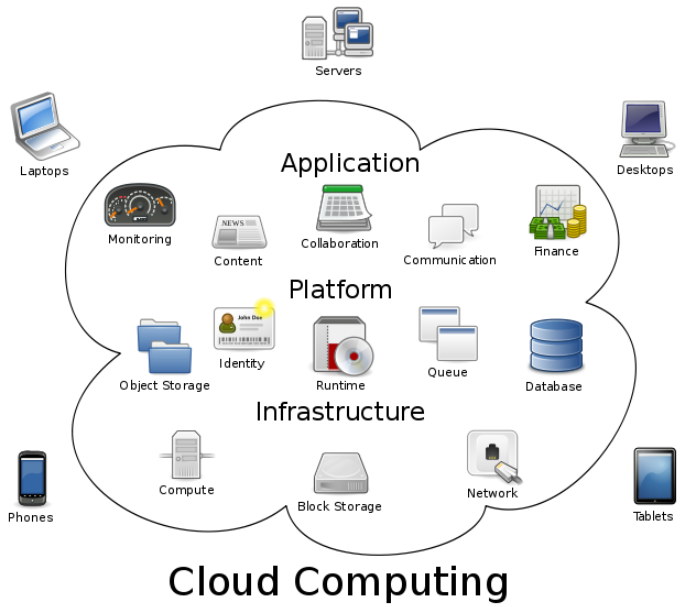

Figure 1.1 cloud computing concepts.

It is well established that each of the individual elements of Cloud computing is critical to economic growth and job creation as the Cloud provides a positive multiplier opportunity. Executing on these policies will promote innovation.

Cloud computing will ensure that innovation is fully harnessed and realized. There is a sharp divide between advanced economies and the developing world when it comes to Cloud readiness. Japan, United States and European Union, have established a solid legal and regulatory base to support growth of Cloud computing. This is significant because, full benefits of a global Cloud computing environment require a broad network of effective laws and regulations

2. Current context of cloud computing in Sri Lanka

What is very common in SriLanken context is outsourcing of total IT functionality. Organisation will use the systems as services and pay monthly rental based on employee count for the service.

Most common application of above is the software vender is responsible for maintenance of platform, soft ware and infrastructure. Further vender as well, outsource the infrastructure and platform from global service provider, which is comparatively cheap and most reliable method for the platform and infrastructure maintenance.

Global service providers are readily available for outsourcing of infrastructures and platforms and real challenge is to develop a product to support centralised solution which caters diversified customer requirements.

As living example in Sri Lanken context hSenid Business Solutions provides its latest product branded as PeoplesHR which is a cloud based application architecture, provides cloud based total solution for global cloud industry.

Infrastructure and platform of the above is outsources from Amazon.com and supporting software architecture is developed in Colombo research office.

Main theme, which uplifts popularity of this PeoplesHR is its business slogan *Simple, Fast, Green*

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Simple means organisation could adopt a solution without following complex processes and without dealing with complex and expensive IT infrastructure formalities.

Fast stand for reduction of implementation cycle time . Since hosted products are readily available it is a matter of start using and the configuration.

Green refers to environmental friendliness of the product, reducing paperwork and contributing green initiatives taken by organisation to the corporate world.

3. Unique characteristics of information and communication technology, which create cloud

- 'everything as a service'

Service-oriented architectures define standard interfaces and protocols (e.g. for discovery, quality, and data transfer) to allow developers to utilise information tools and functions as services that users can access without knowledge of, or control over, their internal workings.

- availability of broadband

Both the reach and capacity of Internet Protocol networks are drivers of cloud computing. Moreover, as capacity grows, more demanding types of data can be used in commerce, entertainment, government, and business. In the early days of the web, data and an occasional image were retrieved by web browsers. Today users routinely download music and short video clips. However, full-length movies at high quality are still beyond most broadband connections.

- warehouse-size data centres

Another driver of cloud computing is an evolution from small, distributed, data-oriented computing centres (e.g. 1000 node3, one petabyte4) to more cost-effective, very large scale commercial cloud services (e.g. 100,000 node, 100 petabyte). This is likely to continue.

- energy efficiency

In some data centres, only 30 per cent of the electric power is used by the IT equipment, with the remaining 70 per cent going to cooling, backup, etc. The last few years has seen rapid learning in warehouse-size data centres on the design of cooling systems (Google, 2009), environment monitoring (Liu, 2007), and backup with the result that power utility efficiency is improving

4. Pros and cons of Cloud Computing

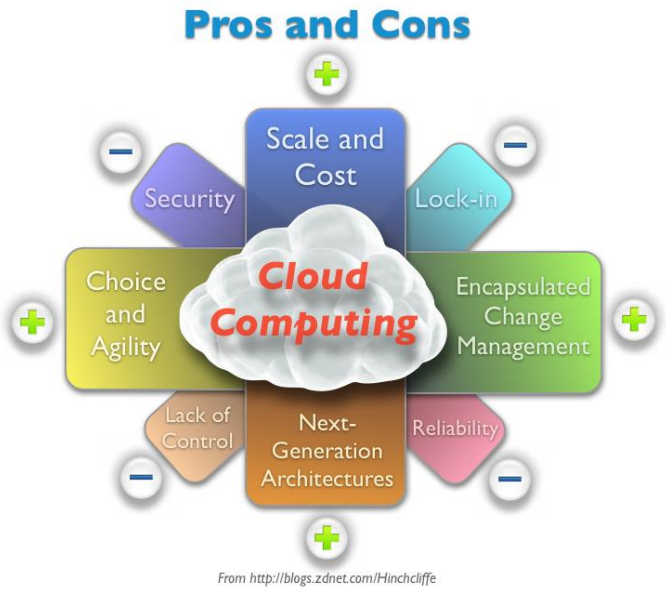

Figure 4.1 Graphical representations of Pros and Cons of Cloud Computing

4.1 Pros of Cloud computing.

- Significantly lower cost required for data processing services when compared with the older model of establishing and maintaining software and its associated hardware on an internal system.

- The use of a cloud system removes the need for the potentially large capital and operating costs associated with purchasing or leasing such software and hardware and shifts the costs to a usage-based model.

- This can also substantially simplify a company's software and hardware structure and the associated costs

- A cloud-based system can also substantially increase the mobility and freedom of your employees and consultants, as it no longer matters where they are located. As long as they have an Internet connection and can access the cloud, they can utilize

the same software packages and do the same work as if they were all in a physical office location.

- Normally the user does not know where the software is located and this is irrelevant in any case. Multiple users from the same company can access the software from anywhere that they have an Internet connection. The costs of cloud computing are normally based on a usage model, with payments being charged on a time usage basis or an occurrence basis.

4.2 Cons of cloud computing.

- Its dislocated nature, which is an advantage in many cases, can also be disadvantageous because the user loses control over the software application and becomes dependent on the provider to maintain, update and manage it

- If something goes wrong, the user does not have direct access to the software and must depend on the provider to fix the problem. If the provider is unresponsive or unable to fix the problem quickly, the user can experience significant issues

  For example, problems would occur if your company uses a cloud-based payroll software system and that system goes down the night before payroll is due. These problems would quickly become much worse if the provider is unwilling or unable to fix the problem and reliable backup services are not available

- If company becomes dependent on a cloud-based software application and the provider is unable or unwilling to continue to provide that application, you will quickly encounter trouble

- Substantial risks in the privacy and confidentiality areas

By using a cloud system, your company's sensitive data and information will be stored on third-party servers, and you will probably have very limited knowledge or control regarding this information. If the provider has inadequate security or encryption systems or procedures, or if a breach of these systems or procedures occurs for any reason, your company's private and confidential data may become compromised

- Entrepreneurs and small companies face special challenges when using cloud systems.

  For example, if a cloud service provider can't or won't provide service, the user's best alternative may be immediate legal action. Many small companies are not able to mobilize their lawyers effectively in this way, and thus they may not be able to quickly cure or mitigate such non-performance by the provider.

  This is also true for the privacy and security risks that I mention above – a small company can quickly get into substantial trouble if a security breach occurs from use of cloud-based systems, and they may not have the resources to adequately react to such a situation.

- cloud-based systems is to develop effective contingency plans. These plans should cover all of the various contingencies that you can anticipate and the proposed ways to deal with these contingencies.

5 Recommendations for improvements of industry

- The success of Cloud computing depends on users faith that their information will not be used or disclosed in unexpected ways.
- At the same time, to maximize the benefit of the Cloud, providers must be free to move data through the Cloud in the most efficient way.
- Users must be assured that Cloud computing providers understand and properly manage the risks inherent in storing and running applications in the Cloud.
- Cloud providers must be able to implement cutting edge cyber security solutions without being required to use specific technologies.
- In Cyberspace, as in the real world, laws must provide meaningful deterrence and clear causes of action.
- Legal systems should provide an effective mechanism for law enforcement for Cloud providers themselves, to combat unauthorized access to data stored in the Cloud.
- In order to promote continued innovation and technological advancement, intellectual property laws should provide for clear protection, vigorous enforcement against misappropriation and infringement of the developments that underlie the Cloud.
- Cloud providers require efforts to promote openness and interoperability.
- Governments should work with industry to develop standards, while also working to minimize conflicting legal obligations on Cloud providers.

  By their very nature, Cloud technologies operate across national boundaries.

- Cloud computing requires robust, ubiquitous and affordable broadband access. This can be achieved through policies that provide incentives for private sector investment in broadband infrastructure and laws that promote universal access to broadband.

6 Conclusion

Business owners should carefully evaluate the use of cloud-based systems.

The substantial potential cost savings along with the increased freedom and mobility offered by the cloud can be significant advantages for a growing business.

You need to be aware of the potential risks and problems that accompany a cloud-based system, however, and take appropriate steps to reduce and mitigate these problems.

While the risks that is mention above will never completely disappear, company can gain some protection by doing good due diligence on the cloud provider, having good, strong documents in place regarding the cloud relationship and having good contingency plans in place.

It’s also critical to get advice and guidance from qualified technology and legal sources in connection with the proposed cloud relationship

To obtain the benefits of the Cloud, policymakers must provide a legal and regulatory framework that will promote innovation, provide incentives to build the infrastructure to support it and promote confidence that using the Cloud will bring the anticipated benefits without sacrificing expectations of privacy, security and safety.

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