CLOUD COMPUTING – KEY PILLAR FOR DIGITAL INDIA

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ABSTRACT

Companies are doing marketing or branding of their products and services using digital media. Life is becoming so smooth and transparent by the sharing of information through the digital mediums. Whether it is a small or a big company, everybody is running for the competition, because they want to lock their customers. In this paper current market scenario is included with respect to cloud computing solution. Data access at present has limitations. Government data which is publicly accessible should have some policy. Cloud Computing is likely to be one of the key pillars on which various e-Governance services would ride. Digital India is a program to prepare India for a knowledge future. Digital India should have policy wherein the Government will be providing information and services to internal and external stakeholders. Cloud computing has become the most stimulating development and delivery alternative in the new millennium. A lot of departments are showing interest to adopt Cloud technology, but awareness on Cloud security needs to be increased. The adoption of Cloud is helping organizations innovate, do things faster, become more agile and enhance their revenue stream. In this paper, the information regarding cloud services and models are provided. Also, the main focus is on what government can do with the help of it for Digital India mission?

KEYWORDS

Cloud computing, Digital India, Pay-per-use model, Security

1. INTRODUCTION

Now a day's everybody wants to get connected with the world. People are getting notifications or messages from the various companies in their mobile phones. These companies are doing marketing of their products and services using digital media [4]. It is very easy to share the information through the digital medium. For a small, medium or big company competition is everywhere because they want to lock their customers. Customers are looking for the organizations or companies from where they can gain more and more profits. Market is also growing fast with the usage of latest technology.

To enable Digital India it is necessary to evaluate the type of services that will be provided to citizens. Government services will be real time for both online and mobile platform by making integration with government laws and jurisdictions. One of the simplest technologies is Cloud Computing. Some of the industry uses of cloud computing are Banking, Education, Government, Healthcare, Media, Manufacturing, etc. With the help of cloud computing basically we can

maximize the effectiveness of the shared resources. The cloud has changed the nature of computing and it will continue to do so through 2020.

One of the key features of cloud is that it is provisioned by the user. Cloud is elastic and it can be metered, so that you can charge on usage basis. The information and services from the Government bodies can use public cloud vendors such as AWS or Microsoft Azure of Google Cloud [2]. This might not be totally secure and it requires having a strong architecture principle and policy to host data and services to relevant cloud delivery model. In this paper I have discuss market scenario with respect to cloud technology and pay-per-use model [1] with the comparison of subscription based model.

2. CURRENT MARKET SCENARIO

Large organizations are focusing on the private cloud to build efficiency within their IT infrastructure. They are exploring applications such as document management systems, CRM and learning solutions [3]. Smaller organizations are looking at public clouds for end-to-end propositions including mailing solutions and ERP. Industry wide alliances are on to offer end-to-end cloud computing services for enterprises.

For example, Mankind Pharma Company [6] wanted to align its IT infrastructure with the business goals of the company, while keeping operations and capital expenditures to a minimum in 2014. So, the company has chosen SoftLayer's infrastructure as the ideal solution to fit the business needs of Mankind Pharma. It is providing the perfect combination of pay-as-you-use option as well as scalability to suit business requirements.

In tiny transaction, pay-per-use media framework must be organized to distribute high-quality data and information automatically on a huge scale. For pay-per-use online services, transactions and service delivery must be similarly automatic. Traditionally, employee's daily computing resources are available in one server at one location, i.e., the infrastructure is fixed. With cloud computing, the infrastructure is provided to the user in an on-demand manner. Security, data availability and privacy are the big issues that need to be overcome for cloud to assume its full potential [2]. According to an International Data Corporation report, the overall Cloud market in India stood at $688 million in 2012. This figure is expected to rise to a staggering $3.5 billion by 2016.

3. CLOUD AT A GLANCE

3.1. Cloud Flavours

Public cloud where resources are dynamically provisioned on a fine-grained, self-service basis over the Internet from an off-site third-party provider [2].

Private cloud provides computing on private networks. These capitalize on data security, corporate governance and reliability.

Hybrid cloud environment is combination of both Public and Private Cloud. This is more typical of cloud computing for most enterprises.

Figure 1. Cloud Computing Architecture

3.2. Cloud Services

Cloud-computing providers offer different type of services according to different models.

IaaS refers to online services that abstract user from the detail of infrastructure like physical computing resources, location, data partitioning, scaling, security, backup etc.

PaaS provider typically develops toolkit and standards for development and channels for distribution and payment. In the PaaS models, cloud providers deliver a computing platform, typically including operating system, programming-language execution environment, database, and web server [2].

SaaS is where a user no longer owns the software but instead uses it when required using cloud computing. The software remains the property of the service provider and the user pays for access either by annual subscription or on a pay-per-use basis.
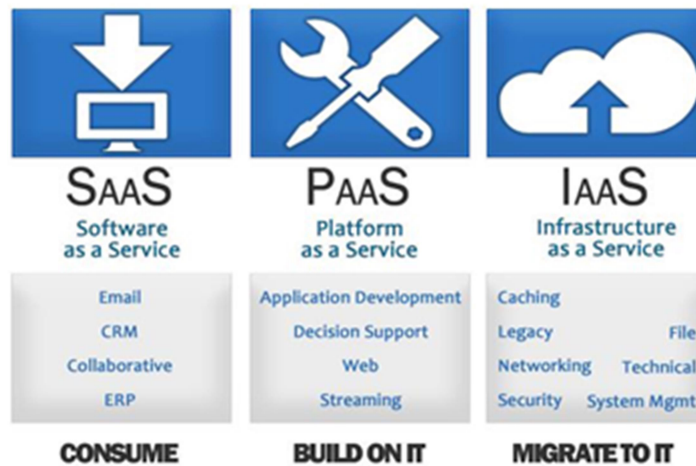
Figure 2. Cloud Services

Many questions are arising in the mind before implementing cloud computing model such as,

What cloud can deliver?
When it should be / not be used?
    What technologies need to be adopted for rolling out a cloud?
    Whether to go for private, public or hybrid cloud?

Cloud computing is about paying for what you need when you need it; infrastructure scaled to the mean of your requirements, not the max out [1]. In the next section one of the model of cloud computing is discussed which can be better utilized for digital India vision and mission.

4. HOW PAY-PER-USE MODEL WORKS?

Software as a Service is deployed typically as a pay-per- use model [1], a subscription model, or a combination of both.

4.1. Pay-Per-Use pricing model is suitable for the following reasons,

The services are not being used constantly by the customers.

It gives greater feedback on accurate pricing and allows the user to dictate their costs.

Due to minimum startup fees, companies are making fast decision to try the services without waiting for a year to finish.

Pay-per-use model actually give the information about how customers are using their products and services. Also, it leads to their profitability.

To consider material cost, i.e. an offline completion cost. If we add various type of costs in the material cost than the pay-per-use approach is better.

Some companies like to go for it because the significance relationship is made very clear to the customer, and they are capable to prioritize quality and service expansion based on the customer's expressed needs [1].

4.2. PROS & CONS OF PAY-PER-USE MODEL

In pay per usage model, customers can get benefit of their services as and when they require of it. That means customers can use their web browser regardless of their locations or devices to acquire the services they want to use from the cloud servers. Here, the multi- tenancy (i.e. an architecture in which a single instance of a software application serves multiple customers) enables sharing of information and resources across a large number of customers. More number of hardware available will increase the availability of information for customers easily [2].

Maintenance of cloud application is easy because, it is not going to be installed on every customer's device. It is installed only in centralized or distributed server. It is important to provide security and privacy to the information which can be shared through cloud computing. There is also a requirement for high level of data control.

Because customers are only paying to use the service when they consciously think they need the service, revenue is less predictable than a subscription or licensing model.

If amount of the bill is unpredictable and not controllable, then neither the subscriber nor the provider can budget effectively.

Customers complain of being burned by pay-per-use models when they fail to warm up when the demand is required. The company which offers pay-per-use model must still operate with the strength of a public utility and be available.

5. LOOKING AHEAD WITH THE CLOUD

The speed of implementation of cloud computing in the government sector is slow compared to private organizations. Public sector institutions are now increasingly discovering the benefit of information systems which is hosted at third-party data centers by the SaaS, PaaS or IaaS [2]. The government is already knowing about the benefits that cloud computing can bring and how it can be an excellent platform for fast and affordable service deployment and delivery. Cloud computing leads to flexible resource allocation since it allows Information Technology to respond to changing demands of system administrators. Administrator can better manage the resources as the demand occurs. Not all IT services and applications are suited for the cloud [1].

5.1. Vision On Cloud

Digital India initiative, which we are trying to absorb, is going to be on Cloud as the Cloud First Policy. We will see new architectures propagating and applications getting restored to ensure the benefits that Cloud can give, and it would be made available in the various projects that are going to come up in the near future. Clearly, the move to Cloud is about business-aligned IT where Cloud drives business innovation and helps meet business goals.

High speed internet shall be made available in all villages. With the help of mobile banking and net banking in villages participation in digital and financial space at individual level will be increase. All digital resources are universally accessible such as government documents / available on the cloud. Also, the collaborative digital platforms for participative governance provide portability of all entitlements for individuals through the cloud [4].

On the occasion of launch of Digital India week, Microsoft CEO Satya Nadella said technology can support the government's initiatives in key areas of the program including rural internet connectivity, digital cloud services for all and communications and productivity services for the government. Also, he said, we are bringing our marquee cloud services - Microsoft Azure, Dynamics and Office 365 - to local data centers in India to accelerate cloud innovation, connect every Indian and every Indian business to the world through our global hyper-scale cloud [8].

In India, broadband network initiatives will eventually stimulate greater acceptance and convenience of cloud services. Cloud computing allow common platforms across multiple agencies, reduce ownership of infrastructure and improve citizen access to service and information. Government can make things more transparent and helps bridge the digital divide by simplifying access using cloud computing.

5.2. What Government of India can do with Cloud?

A government organization should start with non-critical applications and non-sensitive data when getting on to the cloud. Government may adopt for private cloud only, to be built and managed within an enterprise. The main concept is to utilize the maximum resources in a more flexible, scalable and lower-cost manner. In case of private cloud data can be more secure. Many people have anxiety that their data will not be in their control. But a clear understanding of setting up Cloud should be there. Another problem is that various departments also do not have the technical resources and strengths [4].

Many Indian projects like Indian Railway, Aadhaar would benefit enormously from cloud computing. Also, creating more and more servers for information sharing will be helpful for government and citizen of India. The Digital India project demands very strong network security at all levels of operation. We should ensure that data will be managed and controlled by each data centers using security policy. Some of the barriers to adoption of cloud in the government are can be attributed to diverse service level agreements, data privacy, open standards, business stability and vendor lock-in [8].

Mr. Anil Ambani said "the availability of unlimited cloud computing power and data centers are crucial pre-condition for the success of Digital India." Also, as per his talk "We have committed to invest nearly Rs 10,000 crore over the next few years to fund these transformational initiatives across the digital, cloud and telecom space." Cloud will be the pillar in facilitating in the delivery of various e-governance services. The Government of India has embarked upon a very striving and important initiative. It is going to be an extremely important component that can bring a standard shift in the way government secures and deploys IT tools and implements e-Governance applications in the country. Many applications of e-governance were written using the client server paradigm. So, there is a very tight coupling trying to split up the applications to make it multi- talented, so that the same application could be used by multiple departments across multiple states, which would not be an easy task [7].

There is a cloud server which is managed by government but hosted by a cloud service provider as a private cloud. This type of model can be cost-effective and secure in terms of capital investments and infrastructures. The public cloud which is cost optimizer, controllable, responsive, secure, scalable, and citizen service-oriented. The tools required to create multi-talented, user-provisioned, highly secure applications that can scale across hundreds of thousands of servers is still not being used in our country. The government has policy to release its open data policy to provide access to the data. [5].

To achieve a secure cloud environment we require combine effort between cloud service vendors and users. Building trust with public cloud services providers while maintaining control of security policies internally are the foundation of building security in the cloud. Gartner said that just 7 percent of consumer content was stored in the cloud in 2011, but this will grow to 36 percent in 2016.

6. CONCLUSIONS

Currently, it is in an early stage but will continue to move into normal adoption, with its economic, green and scalable development and delivery mechanism. A look at the present government's manifesto is good enough to suggest that it intends to leverage IT in each and every segment, without an exception. Multiple levels of security for networks, software and applications are required. If there are thousands of servers in a data centre, lots of care needs to be taken about how those are designed and built, because the current generation of data centers have efficiency that is two to four times better than what we are seeing currently in India. [3, 4]. More industries are turning to cloud technology as an efficient way to improve quality services due to its capabilities to reduce overhead costs, downtime, and automate infrastructure deployment. The DIT, Government of India, is in discussion with industry representatives on faster adoption and selection of right paths for sharing of resources [8].

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