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Cloud Computing Adoption and its Impact in India

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Abstract - Cloud computing is a technology buzz word in the past which provides a paradigm shift where computation power, storage and network resources are provided as a service. Instead of buying expensive hardware and software which needs installation, configuration, maintenance; the cloud computing facilitates the usage of cloud application and infrastructures based on pay as you go scheme. In India with huge population, Government, Entrepreneurs and Universities which do not have huge computation power and storage facilities to run their applications and to meet the varying requirements. Thus cloud computing offers computing facilities and sophisticated IT applications to meet the brisk changing requirement in the IT world. This paper discusses the various opportunities and challenges in the area of cloud computing and its impacts in the India. We discuss and compare the major impacts and challenges involved in the adoption of cloud computing in various areas in India.

Key Words: Cloud Computing, Technology adoption, Indian Markets

1. INTRODUCTION

This Cloud computing provides services such as on demand delivery of database/storage, compute power, applications and other IT resources through internet on the pay as you need basis.

The name "Cloud Computing" is because that the information will be in the "cloud" which needs to be accessed and the user need not be in a particular location to access the information.

The user can store information on remote servers and can access it from anywhere through internet by using the cloud services provided by the provider. Most of them use cloud services in their daily life and which they are not aware. The daily routine such as sending mails, listening to music, watching TV channels, editing documents, playing games and many more uses cloud compute and storage services.

It is already been a decade since the cloud computing era started but still only a considerable number of organizations are making use of cloud services.

In India cloud computing has evolved to viable from a desirable alternative to traditional IT. The chief information officers are continuously planning to migrate already existing systems to the cloud.

Public cloud platforms are addressing the requirements of the most new business applications for both development and hosting.

Gartner expects that the Chief Information officer might move to a multi-cloud strategy from a single provider and also more complex workload is been put to the cloud by the Indian market.

There is a boom in adopting the public cloud for use cases like development and test basis technology on cloud, big data analysis and collaboration and messaging. Organizations will execute a good figure of high-reward with high-risk projects based on AI and IOT technologies [1].

As per Nasscom, the cloud market in India is anticipated to grow three times to $7.1 billion by 2022 due to the adoption of Machine Learning (ML) and Artificial Intelligence (AI) technologies

2. ADOPTION IN INDIAN MARKETS

2.1 Challenges for the adoption of cloud computing in India

The challenges that India is facing for the growth of cloud is that data security and lack of internet connectivity in rural areas of India.

The first and foremost challenge for the government is that the control on the data because when the data is stored in cloud it must reassure the protection of the data on the same level if the data is locally stored.

The second challenge is that the privacy and security since the data of government is separated and it can be accessed through open network. The next challenge is that the performance of the data which is affected by the distance of the user and the location of the cloud which might geographically far distanced and also the speed of the internet depends on the performance and also the number of users acting on the data at the same time will affect the performance.

Apart from the above mentioned challenges, there is fear among the consumers possibility of vendor lock-in[3], Service providers reliability, variation of cost over a period of time etc. Even no seller can promise a platform that is free of possible downtime.

2.2 India IT spending forecast

According to the report published by Nutanix, 43% Of Indian Enterprises are going to adopt Hybrid Cloud by 2020. Figure 1 shows the percentage of IT spending in various areas during the years 2017 to 2022.

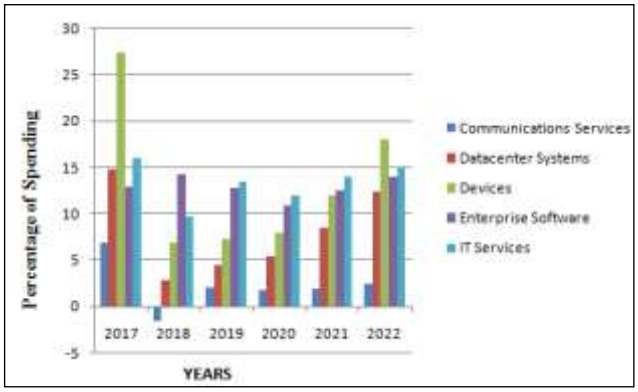

Figure 1: India's IT spending forecast

Public cloud provides resources to the general public over Internet which is expected to grow at a CAGR, of over 34 per cent to touch $3.9-4 billion by 2020. Total public cloud spending in rose to 35-45 percent of IT/ITeS. There is a huge investment in data centres by technology providers for banking, insurance segment and financial services are driving cloud adoption in India[4].

Within public cloud Software-as-a-Service (SaaS) is expected to continue to be the highest spend category at $2.6-2.8 billion, followed by Infrastructure-as-a-Service (IaaS) and Platform-as-a-Service (PaaS) by 2020 cumulatively accounting for the amount of $1.2 billion[5].

2.3 Adoption in Indian Market

In India, Cloud adoption is benefiting significantly in many sectors including Government, SME, Education and Healthcare.

In health industry utilize cloud to create national citizen health database. To facilitate healthcare services in remote and interior areas of the country Cloud's telemedicine services are used. Government agencies can utilize cloud infrastructure to spread out new schemes/services and can be used to reach quickly across geographically distributed offices to work collaboratively. For the growth of the nation Digital transformation is recognized as an important initiative. Digital India visualizes creating high-speed digital highways, which will impact business and create a digital path for every human being[6]. The building blocks for the digital India is based on the technologies such as Internet of Things, mobility, analytics, and cloud computing.

3. IMPACTS IN INDIAN MARKETS

As the cloud computing technologies becoming widespread in many organizations, there is global requirement for professionals is gradually on the rise. Cloud computing frees companies from potentially expensive costs of purchasing, managing and maintaining on-premises hardware and software infrastructure. With Software as a Service (SaaS), the most up-to-date versions of the applications required to run the business are made accessible to all customers as soon as they're released. New upgrades include latest features and functionality make the worker's to be more productive. The services provided by the majority cloud providers are very reliable, with almost 99.99% uptime. As long as Internet connection is available the applications will work. Even Some applications work off-line. Cloud is flexible enough that the elasticity feature automatically enable to increase or decrease the amount of resources needed based on the demand, thus reduce the cost to the consumers.

Enhanced mobility is one of the main benefit of cloud computing. People can take their work anywhere anytime via smart phones and tablets. Cloud computing enable people to easily cooperate with each other and work to achieve a common goal. Using Cloud applications dispersed groups of people can collaborate with each other, virtually meet and share information in real time and via shared storage. This ability can decrease time-to-market and improve product development and customer service. With smaller number of data centers across globe with more well-organized operations can reduce the impact on the environment. Shared resources by the multiple applications perform server consolidation. Thus it reduces the carbon emission which is a green initiative.

In India until now no legalization of cloud, but 'Cloud services' have been particularly recognized under the Integrated Goods and Services Tax Act 2017 under 'online information and database access or retrieval services' and consequently the services provided by cloud service providers would be subject to GST. Section 43A of the IT Act 2000 read with the Information Technology (Reasonable security procedures and practices and sensitive personal data) Rules 2011 (the Privacy Rules) provide guidelines for the compilation, use and protection of any sensitive private data or information of natural persons by a body corporate that possesses, deals with or handles such data. The IT Act and the Privacy Rules together set out the regulatory structure for creation, collection, processing, storage and use of electronic data in India. The government of India has a published a Personal Data Protection Bill, 2018 which if notified will renovate the existing privacy and data protection framework in India[7]. The Bill is in many ways alike to the EU's General Data Protection Regulation.

4. CONCLUSION

Cloud computing frees companies from potentially expensive costs of purchasing, managing and maintaining on-premises hardware and software infrastructure. This paper discusses the issues related to the adaption and impact of cloud computing in India. The major sectors where cloud computing is adapted are government sector, health sector, Educational sector and SME's. We discussed the various opportunities and challenges in the area of cloud computing and its impacts in the India

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