Chapter 3

Cloud Computing & Indian Economy
CHAPTER 3
CLOUD COMPUTING AND INDIAN ECONOMY

3.1 Cloud Computing and Indian Economy – An Insight

India, currently the fastest growing economy in the world, has unique features of development. Initially an agriculture dominant economy, the economy has transformed into a service sector driven economy. Currently the service sector contributes around 53% Gross Value Added (GVA) of the country and 58% in Gross domestic Product (GDP).

As can be proved by the statistics, India has graduated from primary to tertiary sector (i.e. from agriculture to service sector). The same is the case with advancement of technology in the country. The surge of IT sector is the biggest proof and the development of cloud technology is following the same trend.

The growth of cloud in India can be understood through some facts and figures. According to a study of Gartner, cloud services will be showing good prospects of growth.

- In all the cloud services, SaaS will be leading the pack; its size will be increasing from $174 million in 2013 to $552 million in 2017 (“India to”, 2013).
- Size of IaaS will be increasing from $59.2 million to $156.3 million (“India to”, 2013).
- Business Process as a Service (BPaaS) will reach to a level of $168 million in 2017 from $63.6 million (“India to”, 2013).
- CAGR of overall cloud services during 2012-17 is expected to be around 33% (Gartner, 2013).
- CAGR of SaaS and IaaS are projected to be 34.4% and 39.8 respectively (during 2012-17) (Gartner, 2013).
- According to IDC, the expenditure on cloud services during 2012 and 2016 will increase by massive 400% (Larkin et al., 2015).
- In another prediction, Forrester expects the SaaS market in India to double during 2014-20 (Larkin et al., 2015).

These predictions by different market research firms showcase a bright future for the cloud services in India. As is clear by the data, though PaaS is also growing but currently SaaS and IaaS are more prominent in Indian Cloud Market.

Despite the bright prospects for cloud adoption in the country, there are several hindrances and impediments in development of a robust cloud market. India is a country where paper work burden in offices, organizations and businesses is still a notable feature. Majority of them are still in want of digitization. Even the places where IT infrastructure has caved in, upgradation is a daunting task. The reason is lack of appropriate skills and infrastructure and high associated costs of transformation/updation.

In the want of sufficient funds, advanced technology becomes prerogative of a few. Lack of basic infrastructure in itself is a big drawback.

Cloud can offer solution to the problems related to high upfront/transformation costs. The firms and businesses which were not able to set up their own IT infrastructure or invest funds for digitization can now avail the benefits of advanced technology at affordable prices. Such firms/enterprises can directly migrate to cloud. In fact majority of SMEs are following this route (Sheth, 2010) argues that “the cloud services ecosystem is evolving rapidly. Active participation from both service providers and enterprises at this
juncture will help create a more robust ecosystem and shorter time to adoption. Indian market is seeing a concerted effort in the related Software as a Service (SaaS) space. The SaaS market is increasingly gaining acceptance in the SMB segment, indicating a shift in the thought process of CIOs and IT decision makers. The IaaS market is also likely to benefit from the increasing maturity of these related markets”.

3.2 Factors Responsible for Cloud Growth in India

Factors responsible for growth of cloud in India can be described as follows:

3.2.1 Demand-side Factors

- Emerging SME sector
- Increasing interest of CIOs of both large and small enterprises in cloud adoption
- Improving connectivity speed
- Commendable increase in internet users in recent years
- Growth in mobile internet users

3.2.2 Supply-side Factors

- Robust IT sector
- Increase in government expenditure on cloud technology
- Increasing interest of Indian IT giants in cloud technology

3.3 Indian SME Sector

The Micro, Small, Medium Enterprises Development (MSMED) Act, 2006 has defined and categorized the Micro, Small and Medium Enterprises (“About MSMEs”, 2015). Accordingly, classification of enterprises under MSMED Act can be understood by Table 3.3.
In the last decade, SME sector of India has experienced exponential growth. India is poised to become the country with largest SME sector in the world economy. SMEs are increasingly becoming the leading driver of growth of Indian economy. The contribution of this sector can be explained as follows (Kumar, 2014):

- There are more than 48 million SMEs in India
- SME Contribution in industrial output – 45%
- Contribution in Exports – 40%
- Contribution in employment – 51% of total workforce
- SMEs constitute approximately 80% of total enterprises in the country
- CAGR of number of SMEs (during 2007-12) – 28.2%
- CAGR of employment in SMEs – 26.4%

All these facts and figures state the importance of SME sector in the development of the country but a very disturbing fact is that despite all these the contribution in GDP is very low (around 8-9%). It highlights the reality...
about the current situation of SMEs which are in want of up-gradation – both technologically and financially.

Though SMEs are making significant contribution in the economy but as far as use of advanced technology is concerned, they are still not IT-intensive. Factors responsible for low IT-intensity are:

- Higher accessibility costs
- Hindrances in adequate availability of internet related infrastructure
- Lack of IT skills
- Lack of information regarding available accessibility schemes

The industries where SMEs have high probability of cloud adoption, as discussed in (“SMEs in”, 2015) are:

- Manufacturing (especially textile, apparel and jewellery)
- Retail Trade
- Education

The greatest opportunity of cloud adoption by SMEs is provided by the surge in mobile internet users in the country. As discussed earlier, India has a history of skipping the traditional paths of development. In the case of development of internet usage also, instead of the increased usage of fixed broadband, the number of mobile internet users is increasing. The broadband penetration rate is quite low but mobile penetration rate is high. As per the latest report of the Internet and Mobile Association of India (IAMAI) and consultancy firm KPMG, mobile internet users are going to get nearly doubled from 159 million in 2014 to 314 million in 2017 (Alawadhi, 2015).

Incremental growth in mobile internet usage depicts the change in consumer behavior. It has further given encouragement to development of mobile applications for myriad purposes. This creates an opportunity for Indian SMEs
to develop business applications and increased forward and backward linkages with the help of cloud computing.

SMEs help in triggering country’s economic growth, prompt people from primary sector towards other emergent sectors/industries of the economy, encourages and generates self employment opportunities and sow the seeds of entrepreneurship. With the help of cloud computing, SMEs in India can play these roles in a dynamic manner.

3.4 Cloud Computing and Role of Government

With the propagation of ICT, governance has also transformed into e-governance. The process started with computerization and digitization of departments, process, initiatives and functions of the government. It includes all the tiers of government – central, state and local. The prime objective of the government behind this exercise is to provide information about various government programmes, schemes, initiatives, etc, and deliver varied services diligently and promptly and also in a transparent and non-cumbersome manner.

With increased use of internet services, the process of e-governance further progressed with the development of websites and portals of different ministries and departments. Indian government started a plan named ‘National e-Governance Plan’ in 2006 with an objective to provide government services to the general public in their neighbourhood at affordable prices.

With the adoption of cloud computing e-governance has gathered good momentum. It will be an understatement to say that the distance between government and public has lessened because with the help of cloud technology the objective of the government is to bring it to doorstep or rather fingertips of the public.
The aim of NeGP Mission is to realise a comprehensive vision of a government private cloud environment available for use by central and state government line departments, districts and municipalities to accelerate their ICT-enabled service improvements and to support the cost-effective ongoing maintenance and evolution of the underlying ICT-enabled environment (“GI Cloud”, 2013). The government cloud initiative is named – ‘GI Cloud’ or ‘Meghraj’.

The basic cloud services like SaaS, PaaS and IaaS will be provided by the GI Cloud. A tentative list of the specialized sub-services is provided as under:

A. **Infrastructure-as-a-service (IaaS)**
   - Compute as a service
   - Storage as a service
   - Network as a service
   - Disaster recovery as a service
   - Backup as a service
   - Virtual desktop solutions
   - High availability services
   - Infrastructure for application development and testing

B. **Platform-as-a-Service (PaaS)**
   - Platform for application, portal development and testing
   - Platform for application or portal hosting
   - Database as a service
   - Collaboration platforms

C. **Software-as-a-service (SaaS)**
   
   GI Cloud, Meghraj, will be providing SaaS services via either applying SaaS models like other cloud based web application services or via
eGov AppStores. Both core as well as general applications, like the reporting facility, messaging facility, mobile gateways and payment gateways will be made available. The eGov AppStores will be deploying applications which may or may not be cloud enabled, so that the user will have the option to either run the application online or by downloading through the eGov AppStores. SaaS services will have the following to offer:

- Email as a service
- Productivity suites (as a service)
- ERP as a service
- CRM as a service
- BI and analytics as a service
- Collaboration as a service
- Identity and access management (IAM) as a service
- Security as a service
- Common central services like payment gateway, mobile gateway, PKI, etc as a service

D. **Data-as-a-Service**

An additional service, data-as-a-service, will be hosted by GI Cloud, that will be SaaS alike service through which consumer will be allowed to have on demand data access.

On the GI Cloud an app store will also be hosted named *National eGov AppStore*. The actors of this app store include application owner (any government department), application provider (government department or independent agency), empanelled agencies (agencies for specific functions), direct and indirect users. Figure 3.4 offers a vivid view of the GI Cloud Ecosystem.
3.5 Indian Economy: Cloud Computing Supply Side

With increase in the demand for cloud services, Indian IT technology giants are concentrating towards the supply of cloud services in the form of SaaS, PaaS, IaaS, etc. Most of these companies are situated in metro cities of Delhi-NCR, Banglore, Chennai, Mumbai, Pune and Hydrabad. Though they have a
tough task as they have to face competition from the global cloud computing
giants like Microsoft, Google, Netflix, etc., yet their reputation in the national
market is a positive aspect for their business in cloud back at home. The
leading cloud computing companies of India as described by (“Top Cloud”,
2015) are:

- Infosys
- TCS
- Wipro Technologies
- Zenith InfoTech
- Synapse India
- App Point
- CtrlS
- Clogeny
- Eaze Work
- Net Magic Solutions
- Tata Communications
- Orange Scape
- Ozonetel Systems
- PK4 Software
- Ramco
- Reliance Data Center
- Synage
- Wolf Frameworks