Emerging Trends In Cloud Computing: Is It A Friend Or Foe For The Economic Development And New Age Of Globalisation: A Case Study Approach

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Abstract :

Cloud computing is a sort of internet-based computing process which on requirement shares the available processed data to computers and other devices. According to Pang(2015) by the end of 2019, the total market opportunity will have the cloud-application subscription and the revenue that will be generated out of it will be 35 percent of the existing market. The growth of individual cloud service providers such as AWS, AZURE, GCP, IBM, ORACLE, Alibaba, etc. reflects in similar lines. These service providers build several data centers around the world, and then use these facilities to provide services to customers from different countries. Major credit goes to the global infrastructure of the cloud, multiple data centers around the world, which ensures the accessibility and availability of critical business data. The main aim and objective of the study are to study the emerging trends in cloud computing and whether it is a friend or foe for the economic development and new age of globalization. The methodology adopted for the research paper is the case study approach. The data is collected different from various secondary sources and the websites of the industry who have adopted cloud computing and study the resultant factors of cloud computing and its impact on globalization. Findings of the study: The cloud computing adoption trends by different sectors of industry to bring agility and business transformation have an impact on globalization. The research paper has implications for managers and researchers. The paper further focuses on the impact of cloud computing on organizations and globalization in the near future.

Keywords - *Cloud computing, globalization, technology, economics*

I. INTRODUCTION

Going by definition cloud computing is a set of principles and approaches to deliver computing infrastructure, services, platforms, and applications—sourced from clouds—to users on-demand across a network.

There are various technologies that are needed for computing such as automation and management tools, operating system, etc. There are various types of clouds that are available such as private cloud, public cloud, hybrid cloud, and community cloud. Cloud computing providers offer their services according to several fundamental models named as: Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS), Business process as a_Service (BPaaS).

Brief description of the main types of of_cloud service offering:-

1. Infrastructure as a Service (IaaS): Cloud infrastructure services, known as Infrastructure as a Service (IaaS), are self-service models to access, monitor and manage data center infrastructure resources

remotely such as a computer, storage, network, and security components.
The consumptions of services by users or organizations based on the pay per use model, which makes it a unique offering instead of upfront IT hardware purchase. Examples are Microsoft Azure, Google Cloud Engine, Rackspace, etc.

2. Platform as a Service (PaaS): Cloud Platform services, known as Platform as a Service, are used for applications while providing related computing services such as different programming languages, operating system, database, etc. Software solutions can be built upon the basic platforms provided by cloud computing organization to customize for the client needs.

3. Software as a Service (SaaS): Cloud Application service, known as Software as a Service, uses the web or internet facilitates to deliver the applications that are managed by a third-party vendor and whose interface is assessed on the client side. Most of the SaaS services run from web browsers without downloads or installable over the internet. An example such as Salesforce, Google Apps, Workday, CiscoWebEx, Citrix GoToMeeting, Dropbox, BigCommerce,

4.Business Process as a Service (BPaaS): Cloud computing service model, known as Business Process as a Service, uses business process outsourcing model to bring agility to the processes, labor reduction through automation and orchestration using deep domain knowledge, technology and global deployment capabilities from service providers, etc. BPaaS is intelligently consuming services from the SaaS, PaaS and IaaS layer. Examples, such as IBM Blueworks Live, DevOps, Continuous Integration and Continuous development (CI/CD), etc.

II. LITERATURE REVIEW:

Tajinder Singh Sahdev, Murali Krishna Medudula, Mahim Sagar (2014)[8] conducted a study on analysis of Barriers for the Adoption of Cloud Computing in Education Sector. According to the researchers in order to develop a hierarchy among the key barriers the Total interpretive structural modeling (TISM) can be used for the adoption of the cloud in the education sector. And can be highly successful in using new technologies in this sector.
TiagoOliveira, ManojThomas, MarianaEspadanal (2014) [12]assessed the determinants of cloud computing adoption. Several factors have been identified that influence the adoption of cloud computing and on the basis of this, a research model based on the innovation characteristics from the diffusion of innovation (DOI) theory and the technology organization environment (TOE) framework was developed which is useful for manufacturing and service sectors at large.

Jalgaonkar and Kanojia (2013) adopting cloud computing can result in a not only reduction in costs and ubiquitous access but also work as attractive payment models, openness. Also, it helps in improved functional capabilities. They have also identified some risks and limitations such as those related to intellectual property, data protection and security, lack of confidence, less maturity in solutions and lack of speed.

III. METHODOLOGY

The aim of the research paper is to study the emerging trends in cloud computing and whether it is a friend or foe for the economic development and new age of globalization.

The first objective of the paper is to find out the importance of cloud computing in today's aspect of globalization. Since we are now talking about the new concept of globalization 4.0 wherein the trade wars have surrounded the world economy and new trends have been emerged in cloud computing due to this new age globalization.

The second objective of the paper is to study the relevance of cloud computing in startups. Whether the startups are really benefitted by today's concept of globalization and cloud computing. Is really a cloud computing is benefitting the startups to enter into new globalization 4.0

Since the methodology we adopted is the case study, the data is gathered through secondary sources such as scholarly articles, newspapers, journals, etc.

1.1 *GLOBALISATION AND CLOUD COMPUTING*

Today we are not just talking about globalization but globalization 4.0, the fourth industrial revolution. The challenges in this sort of globalization are manifolds as there is the rapid emergence of the global trade wars, sustainability aspects, and various ecological constraints. We are ushering into a new era of globalization. The various frameworks are emerging.
1. Global Public-Private cooperation - It is all about building environmental sustainability and driving economic growth and building and nourishing up the private sector with social inclusiveness.
2. New IR business models – The new economy has merged and disrupted industries and dislocated millions of workers. The new type of innovative economy has

emerged with a different pace, new norms, standards, and policies.

3. Using cloud computing to narrow the gap and exchanging the technological, and geographical boundaries. The crossing of technological, geographical and administrative boundaries, concentrating information and services in data centers and devices that are remote but accessible online at any time, from anywhere and from almost any device or terminal due to cloud computing. The globalization benefits of cloud computing, together with other benefits such as virtualization and scalability, enabled fast growth and adaption of the cloud computing technology by various organizations. As per projected the revenue of the cloud platform and infrastructure market has seen growth by 20% from 2015 to 2018.

1.1.2 *EMERGING TRENDS IN CLOUD COMPUTING :*

There are four major emerging trends that are going to change the nature of the business in the near future There will be a rise in the number of cloud services and solutions. According to a study by Bain & Company the SaaS i.e., the subscription-based software-as-a-service will grow by the end of 2020 and the growth that is projected is 18 %.

Another study by Gartner focused on the Infrastructure -as-a-service (IaaS) and the market is predicted to reach $72.4 billion worldwide by 2020. The _investment in platform-as-a-service (PaaS) will grow from 32 % in 2016 from 56 % in 2019service Companies like IBM, Microsoft, Google, Intel are racing to build the first quantum computer that can solve the complex medical problems, give accurate weather prediction, advance AI and financial modeling.

Alibaba has launched an 11-qubit quantum computing service which is currently available on the quantum cloud computing platform. By the year 2023 the global quantum computing market will be worth $1.9 billion. Companies by the end of 2019 will opt-in for Hybrid cloud solutions that will help them to access the efficiency and effectiveness of cloud solutions and also further helps the CIOs to understand the advantages and disadvantages of each cloud before making a decision that best suits their businesses. Eighty-three percent of enterprise workloads will be in the cloud by 2020 due to the introduction of the General Data Protection Regulation (GDPR). As per the_ situation, 41% of enterprise workloads will run on public cloud platforms while another 22% will be running on hybrid cloud platforms.

2.1 *ROLE OF CLOUD COMPUTING IN STARTUP* –

Startups today are the game changers in the organization at large. They are performing multiple roles in job creation, technology innovation. For any startup to grow fast it is important to use a cost-effective tool. One of the most important tools the startups eyed upon is Cloud computing.

Although it is an effective tool but still more research needed to be done on identifying the usage of cloud computing on building up the competitive advantage and helping them to grow and sustain in this new era of globalization 4.0 which is the beginning of Fourth Industrial revolution and Global trade war.

In research done by Edlund and Livenson (2012) on the implications of cloud computing on startups, 5 characteristics have been identified which have implications on the startups.

a. On-Demand Self-Service- It means that the users can provision computing capabilities such as server time and network storage without the need of human interaction between the users and cloud service providers, in an on-demand self-service manner. To startups, this means that they can easily and quickly get the IT infrastructure that they need. For small companies who are on their very early stage, sales contract negotiation is not their strongest side. Furthermore, for early stage companies, the need for server time and network storage is extremely unforeseeable, therefore on-demand self-service characteristic of cloud computing is deemed very valuable.

Example for this was Yieldex using Amazon Web Services to demonstrate their publishing service in front of investors for the first month costing only 40 USD in total. On-demand self-service-_ This _characteristic of cloud computing made this possible by allocating cloud resources for the actual meetings and freeing the resource after the meetings right away, without human interaction and on-demand.

b. Broad Network Access- This means that cloud computing capabilities can be accessed over the network through standard mechanism with various computing devices such as smartphones and laptops. The implication it has towards startups is the emergence of an entirely new range of services by using cloud services and distribution platform for mobile clients. A small company can grow overnight

into a much larger company by offering services in a scalable method with this delivery chain. Examples for this are the Apple App Store distribution platform and Android applications that are supported by Google App Engine backend.

c. Resource Pooling – Resource Pooling means that the computing resources of the cloud service provider are pooled to serve several customers utilizing a multi-tenant model, and according to customers demand, the different physical and virtual resources are assigned and reassigned dynamically. Although the customers usually do not have any control or knowledge of the precise location of the resources, the users can identify the location at a higher level of abstraction, such as the country or the datacenter. The resources that are pooled include storage, processing, memory, network bandwidth, and virtual machines. To startups, this is one of the motives to choose public IaaS over having their own infrastructure, because of the cost-effectiveness.

d. Rapid Elasticity- It means that the cloud computing capabilities can be rapidly elastically provisioned, sometimes even without human interaction, to either scale out or scale in. In the customer point of view, the available capabilities to be provisioned frequently seem to be limitless and can be purchased in any quantity at any time.

Towards startups, rapid elasticity makes the organization can rapidly adjust its service to meet customer needs. As a result, the organizations enjoy the benefits from acost-effective scalable business model. Example of this trait is Animoto, in which the service was built directly on IaaS, transferred its photo presentation application to Facebook and triggered a huge peak in usage. Animoto utilized RightScale and Amazon to be prepared to manage the peak in a cost-effective way.

Other examples including Dropbox and other storage services also utilize this feature to be able to sell storage space on demand elastically to steer clear from huge overhead in capacity. From the investor's point of view, the implementation of cloud computing in startups is also very attractive. Investors do not have to invest in expensive IT infrastructure in the early stage of the startups.

The option of purchasing their own infrastructure will arise only after the organization matures and decide they need to do that for security reasons or minimization of the total cost (Edlund & Livenson, 2012). At the same time, shutting down startups that cannot meet the expectation is very easy. Since the startup uses virtual IT infrastructure, there is no need to consider the IT infrastructure leftovers.

3.1 CASES OF THE ORGANIZATION USING CLOUD COMPUTING TO BECOME A GLOBALIZED ORGANIZATIONS

3.1.1 ***InterContinental***: Cloud True Believers InterContinental Hotels Group started with the cloud computing wherein they move to the concept of the hybrid cloud computing which is the blend of the in-house cloud center with public cloud services from providers such as Amazon. IHG uses Salesforce.com CRM.

IHG adopted the Amazon Web Services' Elastic Compute Cloud infrastructure for its software development and testing, which lets the developers access pay-as-you-go servers in minutes. This can make the cloud moving and building up its next-generation data center capacity. The group is building a new private cloud Camelot, using a Hewlett-Packard BladeSystem Chassis and VMware virtual machines and management and wanted to built tools. The group is currently using SaaS, Infrastructure as a service and a private cloud.

3.1.2 ***RehabCare***: Going Mobile RehabCare Group, founded in 1982, has grown to be the third largest supplier of acute care rehabilitation services in the U.S. The group has around 11,000 physical, occupational and workplace therapists in 42 provinces. In 2000 RehabCare started a treatment app on a Palm Pilot which include individual therapists time and treatment which is further connected via PCs in local hospitals to central servers.

The process became cumbersome and the group decided to run its own custom based home built software on the iPod Touch, which it delivers through Apple's App Store. The software works on the sync basis provided by Casamba wherein it each therapist is equipped with the iPod captures the time spent on each patient which it periodically uploads on the server and it runs on an application known as Point of Care.

Apart from recording the start and end sessions of each patient, the app also provides the details of the therapy, equipment's used, medicines and also the time and rate of the bills. The company is currently working on a pre-

admission screening application that should require less paperwork to add a new patient.

3.2 CASES OF STARTUPS THAT HAVE ADOPTED CLOUD COMPUTING AND ARE SUCCESSFUL

3.2.1 ***ServiceMax And NVoicePay*** startups relies on Force.com and Microsoft Azure respectively. They depend upon the cloud and runs little on their own data center infrastructure also. NVoicePay wanted to help small businesses automate invoice payment. They linked to the accounts receivable system in QuickBooks and Great Plains accounting software, and integrate with other software for tracking which vendors accept electronic payment. The company has in-house servers store which keeps the customer information when the customer pays a vendor, the actual transaction by credit card or direct funds transfer and executes the actual transaction between businesses. The company feels that this process keeps the transactions PCI compliant as it never puts the customer identity and other sensitive information into a cloud infrastructure. Currently, they are using Azure cloud as an accounting hub to handle the databases that have only an encoded version of the customer's identity but the customer couldn't be defined.

It is also used in the accounting updates but the major problems remain unresolved. How do you coordinate database services that are on premises and in the cloud? Nearly all cloud users find they still need on-premises systems, particularly for sensitive information. With the rapid evolution of various consumer devices, it is very difficult to identify the operating system for long term platform.

Although Amazon, Microsoft, and Salesforce are there they still failed to satisfy the startups _when it comes to the-business production systems and data in the cloud.

3.4 IS CLOUD COMPUTING IS A FRIEND OR FOE FOR START UPS:

Karoo, a London based taxi comparison app was closed 6 months after the launch despite raising $250m. The company lost the market and money due to its poor displacement of the product. They started a campaign to entice the customers to use the service and in order to lure more investments in their business, they started promoting that their app is widely used by the customers at large. In order to increase their customer power, they started offering free rides to their customers. But the problem is that there app codes which they are providing never expires and leaving the people always using the free rides coupons.

There were a lot of bugs in the app which prevents the app from accepting the credit card payments. The company faced the problem of poor product execution and was rated as the poor downloaded app in the UK Another startup a free messaging app firm based in Berlin started the 'sweet spot' of sharing files over messaging. The company raised $1 million but they still could not attract the users and with a lot of the problems in the app they lost their initial users.

This inability led to a lot of problems such as failure of the retention of the customers and this detracts further investments from their investors. Eventually, the app was shut down was this technology was acquired by acquired by another Berlin-based company 6Wunderkinder, founders of Wunderlist. The app was claimed to be somewhat ahead of its time solving a problem that served a very small proportion of users.

3.5 CHALLENGES OF CLOUD COMPUTING:

No matter how advanced technology is there are still several challenges that it has to face. The same thing with cloud computing. There are several shortcomingsto this particular technology. Arutyunov (2012) has compiled several shortcomings in this technology as follows:

• Permanent Internet connection – this might be the strongest shortcoming against cloud computing. Since this technology heavily relies on the Internet, there are no jobs, applications, or documents that can be carried out without Internet access.

• Work is difficult under conditions of slow Internet access – aside from requiring permanent Internet connection; some cloud services need a fast Internet connection with high bandwidth to be able to work properly.

• Programs may run more slowly than on a local computer – when the user needs to transfer a large amount of information, the program they are using will run faster on a computer compared to running it through the cloud, not only because of the Internet speed but also because of the overcrowding on remote servers and troubles on the path between the user and the cloud.

• Not all programs or their properties are available remotely –comparing a program that runs locally and their cloud counterparts will most likely end in the latter not having as comprehensive functionality as the former. Example of this is Google Docs spreadsheet not having as many functions as in Microsoft Excel. Software – in SaaS, since the provider has full control

of the software, the user has access only to utilize the service and cannot customize it to fit their needs.

• Security – this is still being highly debated whether this can be regarded as benefit or shortcoming. It is true that a trustable cloud provider has a fairly reliable system, even much more reliable than startups that are not focusing on IT infrastructure. However, there is no technology that ensures the absolute confidentiality of data at the moment.

Personal Information – A substantial amount of personally identifiable information and sensitive personal information is stored in the form of data stores, storage, backups, etc. on to the Cloud platform. When PI is stored in the cloud, it is virtually impossible fro a user or consumer to know actually compromised their personal information.

Service providers try to shrug their shoulder by saying, it is not their fault. Hence, Consumer/Companies availing cloud services need to access, how safe is it to store any sensitive PI onto the cloud. Stories about data leak or stolen due to security breaches are not hidden from anyone in recent past.

Data sovereignty is another aspect which startup and large organizations need to sign up with Cloud service providers carefully.

CONCLUSION

On one hand cloud computing having innumerable numbers of benefits for startups such as Pay as per consumption, agility, scalability, low cost, quick market test with no/minimal capital expenditure etc. but on the other hand coping up with the changing pace of the innovative solutions/applications or services built on using cloud computing is quite challenging. Over and above, a substantial amount of Personally identifiable information and sensitive personal information stored in the cloud is crossing countries boundaries within a fraction of seconds without the consumer even realizing it.

This is quite a dangerous situation especially for startups which is having nearly 90% shutdown rate (as per FORBES). In addition to this, large companies/organizations are bringing agility to their business (to cope up with the changing business needs), market testing before launching a new product, etc. by making use of cloud services within a short duration and with minimal capital expenditure.

Also, from last few years, most of the large size organizations/enterprises are in a different facet of cloud adaption journey by going through Business Application transformation or IT transformation. But, the pace with which this IT or Business Transformation are planning to adapt Cloud first strategy, skilled IT resources, organization change management, and data security is quite challenging.

In my view, Cloud computing is a survival strategy to cope up with the globalization but it needs considerable due diligence to be successful and innovative. Hence, Cloud Computing is both a friend and a foe for enterprises and startups.

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