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Article

A Study-Cloud Computing and its Application in Indian Context

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A B S T R A C T

The term "cloud computing" may be a current buzzword within the IT world. Behind this extravagant poetic expression around lies a real picture of the longer term of calculating for both in methodological standpoint and social outlook. The term "Cloud Computing" is current but the concept of cloud of storage in distributed data centers handled by third party companies and centralized computation is not new but it came in way back in 1990s along distributed computing approaches like grid computing. Cloud computing is intended in the direction of as long as IT as a service to cloud users on-demand with larger flexibility, scalability, accessibility and dependability with utility computing model. This innovative typical of computing has an enormous possible in it to be castoff in the sector of e-governance and in rural growth perception in emerging countries like India.

Keywords: Business Model, e-Governace, Cloud Computing

Introduction

The period Cloud computing gains its prominence first by Google's CEO Eric Schmidt in the end of 2006. Consequently the origin of cloud computing is significantly new method even its source have its place to convinced old opinions with innovative business, procedural and social viewpoints. Afterward the architectural opinion cloud is relaxation on a prevailing grid grounded architecture and practices the grid facilities and enhances certain expertise like virtualization and a few business models. Cloud is actually a bunch of commodity computers networked together in same or dissimilar geographical locations, operating together to serve a large number of consumers who are having different need and workload on demand basis with the assistance of virtualization. Cloud facilities on condition that to the cloud users as usefulness service station like electricity, telephone, water by means of pay-per-use business model. These usefulness services are generally labeled as XaaS (X as a Service) where X are often Software or Platform or Infrastructure etc. Cloud users practice these services as long as by the cloud providers and form their submissions in the interior the internet and therefore deliver them to their end users. Accordingly the cloud users don't essential to apprehension around connecting, upholding hardware and software desirable and they can also afford these services as they need to pay the maximum amount they use. So the cloud users can reduce their expenditure and energy within the field of IT using cloud services some what than establishing IT infrastructure themselves. Cloud computing is growing now-a-days in the interest of technical and business organizations for their availability, reliability, scalability and utility model but this can also be beneficial for solving social issues.

In the recent time e-Governance is being implemented in developing countries to enhance competence and effectiveness of governance. This approach are often improved much by using cloud computing rather than traditional ICT. In India, economy is agriculture based and most of the citizen's sleep in rural areas. The standard of living, agricultural productivity etc. are often enhanced by utilizing cloud computing during a proper way. Both of those

applications of cloud computing have technological also as social challenges to beat.

Cloud Computing Application in Indian Context

Most of the studies in cloud computing is said to commercial benefits. But this concept also can be successfully applied to non-profit organizations and to the social benefit. In the emerging countries like India Cloud computing can cause a revolution within the field of low cost computing with greater efficiency, availability and reliability. Recently in these countries e-Governance has begun to flourish. Experts envisioned that utility based computing features a great future in e-Governance. Cloud computing also can be applied to the event of rural life in India by building information hubs to assist the concerned people with greater access to required information and enable them to share their experiences to build new knowledge bases.

e-Governance

e-Governance is an interface between Government and public or this will be an interface between two governments or between government and business organizations. Objectives are generally to enhance productivity and helpfulness to serve public demand and to save lots of costs for online services. This requires Government to possess the desire to decentralize the responsibilities and processes and begin to possess faith on electronic and internet systems. E-government may be a sort of e-business in governance and refers to the processes and structures needed to deliver electronic services to the general public, collaborate with business partners and within an organizational entity conduct electronic transactions. This e-Governance are often greatly improved by utility computing.

Impact of Technology in e-Governance

24/7 Service Model: Services and systems require high obtainability. Citizens must feel that Government is usually at their service.

Need for Content: Web contents should be regularly updated and therefore the information provided to the general public should be sufficient. Respective departments should be responsible for providing the information.

Human Resource: Building these IT skilled resources would wish properly trained personals. This way government can compete with other private organizations.

Security: Sensitive Government data needs to be highly secured. Policies are to be taken seriously maintained and designed.

Privacy: Personal data should be given sufficient privacy. It are often a difficult issue if data is stored across different departments and computer systems.

Why traditional systems are not sufficient?

For maintaining traditional systems in e-government there are more disadvantages.

Application Life Cycle Management: Applications are mostly developed in evolutionary manner and changes should be consistent across all the departments and up gradation should be done when the system is functioning.

Software Licensing: Software should be licensed for each and every department terminal. This incurs a large amount of establishment cost.

Scalability: Scalability is the inherent weakness in traditional centralized systems.

Security: this is often the foremost crucial aspect for e-Governance. Government information is highly sensitive. So they should be highly secured. For the normal systems all the systems across all the departments should have sufficient security. 20 Cloud Computing Most of those disadvantages are addressed by cloud computing.

Scalability: Cloud computing intentionally supports scalability. The data centers have enough storage and computing capacity to cope up with the spike demand.

Modifiable: Applications hosted in cloud are often modified internally without an excessive amount of concern of the top users. Change in one place would reflect altogether the places inherently and it might be consistent.

Data Logging: This central facility are often very useful for locating any fault within the system. Logging also can be used for detecting unauthorized usage checking or detecting compromization.

Availability: Cloud services are documented for top availability. If any data center is down for any reason there's hot backup able to work immediately. Virtual machine migration is employed to great extend during this situation to facilitate load balancing just in case of failure of some systems.

Reliability: Replication and migration of instances across data centers make the reliability of the system very high within the cloud scenario.

Physical Disaster Recovery: Backup policies are often very useful for physical disaster avoidance and this is often inherent to the cloud system. Data is stored in several physical location in order that hot backup are often provided whenever needed.

Policy Management: Polices can be managed in a centralized fashion. This is helpful for introducing Government policies readily unlike this scenario.

Legacy Software: An already developed software are often moved to cloud with minor changes some times. So the government doesn't prefer investing on developing applications which it already has.

Pay model: Cloud providers' pay-as-you-use model enables the customer (Government) to scale back cost of deployment and control the usage.

Reduce Power Consumption: Adaptation of cloud reduces power consumption in several offices and usage of power is concentrated within the data center only. But also that's not the priority of the govt as those data centers are to be handled by the third party who provides cloud services.

Though it seems that cloud computing is indispensable for e-government but there are many issues associated with Cloud Computing application.

Security Concern: Government works are highly security sensitive and therefore the policies sometimes must not be enter public. But in cloud computing scenario security isn't properly implemented today. So this is a big concern.

Policy Concern: The third party cloud provider may have contradicting policies with that of the government.

Lack of Faith in Networks: Innumerable government departments don't have that much trust in networks and internet. So they wouldn't prefer cloud computing.

Rural Advancement

On the substance of country progression cloud computing can also be castoff to advantage for its federal storage and computing properties and utility grounded pay–per use model. As per 72.2% of total Indian residents exist in in rural areas. In stage with the examination showed by "Hole within the Wall project" processer literateness among boys and girls old group 8-14 in geographical region varies across the regions of India. It's 40- 50% in most of the regions. That the computer literacy isn't a priority in rural India and also in it shown that learning rate is pretty high for computer literacy. Agriculture is India's biggest employment source, accounting for 52% employment in India. And agricultural sector contributes to twenty of country's total GDP. So it's important to create a significant try and develop rural India.

Rural advancements are often within the kind of education, agriculture, health, culture or in the other fields. Now days most of the villages have some access to electricity and cell phone. So there's technical feasibility of building computer systems. But the mentality of the people haven't been changed that much and that's why the spread of non-public computer isn't that much significant within the villages. we predict this rate of growth are often enhanced if the system is basically cheap, easy to control with minimum level of information, without upfront commitment and more essentially if the system is useful to reinforce their life style. The most aim of the system is to create the people in rural areas to own access to recent technology and with the assistance of the system enhance their standard of living and also this is able to cause a greater good of developing the state.

Why not traditional web services?

Availability: Many of the services should be accessible in the least times like health etc. These availability issues don't seem to be that well handled by the normal web services as they're handled typically by one server and thus the server downtime is usually there to happen.

The Villagers Need to Own a PC: To use traditional web services through internet the villagers have to own a PC which might increase their investment. Then the problems of need for technical experts for software/hardware installation and maintenance are needed. But naturally the quantity of such experts is incredibly less in number within the remote village. Upgradation of software or hardware would be an issue both economically and technically. With the assistance of cloud computing this could be made possible. We are now going to discuss the technological and economic advantages for using cloud.

No Upfront Commitment: The villagers do not need to invest too much in buying computing system and commit. But instead they can have very low cost terminals with basic functionality of input/ output and have a network access.

No Maintenance Issues : The users needn't to be an expert for maintenance. This solves the unavailability of technical experts within the remote villages because the upkeep issues are handled by the cloud provider explicitly.

Upgraded Version of Hardware and Software: The users every time use the updated version of software and hardware as maintained by the cloud service provider. This reduces the price of up gradation.

On-demand Resource Allocation: The virtual resources provided can be extended based on the user's requirement. If the user needs more resources then it's provided on-demand basis.

Utility Computing Model: The economic pattern used by the cloud is pay-as-you-use. This enables the users handle the monetary value they need to pay. By using cloud computing model some improvement of the present system is feasible to create social and in addition as economic prospect in rural India.

Share knowledge and build knowledge base: Most of the agriculture related issues are generally local and that they can't be solved by general expertise. So it happens persistently that the so called experts don't seem to be the correct person to answer the issues but instead the local farmers are better in understanding. So in these situations better solution may be given by the local experts. If these local experts access a typical space to share their knowledge then others eventually come to grasp about the answer. Thus a mental object may be build which might represent the problems therein local scenario. It's like building Wikipedia.

Health and Medical Services: Within the emerging countries like India one in every of the priority of Rural health care is in spite of best intention from both the medical professionals and patients a practical challenge is faced for difficulties of interaction among concerned parties. This issue may be solved using cloud computing in an appropriate way. Consultation among doctors round the world make sharing of information possible and takes telemedicine to the following level, creating a network that goes beyond the one-to-one, patient to-patient, patient-to-doctor or doctor-to-doctor interactions. During this way a patient laid low with a selected disease may be better treated by consulting with doctors within region and also outside who may have more experience with such a case.

Education in Remote Areas: Education in rural areas may be enhanced with the assistance of distance education. Education may be provided in several languages and with relation to different curriculum with the help of e-learning components. Students may be encouraged to make their own multimedia presentations. These may be hosted within the cloud. this sort of approach encourage the scholars to concentrate more on learning and representing the fabric and also that may build the knowledge within the cloud for other students to refer. This can be possible with the help of cloud computing with greater reliability and availability.

Government Decision Making: Watching the public knowledge base the govt. can have a good knowledge of the local situation and take adoptive steps.

Access to Information Hub: Government can provide relevant information like land revenue data, weather data, soil information etc. through these cloud services to the people concerned. All of these things are possible by taking the right initiative. These may have customizing the first cloud services. Some generally unpopular services like Desktop as a Service may be in these scenario which essentially tells about providing the users with a virtual desktop environment. But deployment of cloud services in rural areas have some issues related to it.

The first and foremost issue for the deployment of internet based services in rural India is that the electricity and networks is not available every time. The electricity and internet connectivity is topic of concern in rural areas for implementing cloud computing. Currently there are kind of initiatives underway to explore alternative to wired Internet, including WiFi, WiMax, satellite-based Internet connectivity. Such a trial is made by Midas Communication technologies and Indian Institute of Madras within the name of corDECT which might be a wireless access system. At the same time it provides voice and 35-70kbps Internet access to wireless subscriber. Another effort is where the authors modified traditional WiFi to make it efficiently add long distance suitable within the context of geographic area.

India is now world's 2nd fastest growing economy. As per World Bank survey, by this year the expansion rate of India's economy would be faster than currently fastest economy China. In India there's very large scope of applying IT in domestic level which encouraged the cloud providers to determine cloud services in India. Today different companies like TATA, Reliance, Wipro Technologies, Netmagic Solutions, Zenith Computers and Reliance are providing cloud services in India successfully. These companies can grasp the large market within the rural India additionally as making social advancement.

Conclusion

Cloud computing is a newly growing prototype of distributed computing. Virtualization in hand-to-hand with utility computing model can make a difference within the IT industry and furthermore as in social perspective. Though cloud computing continues to be in its initial phases but it's clearly gaining momentum. There are dissimilar organizations like Google, Yahoo, Amazon etc., that are already providing cloud services. There are various products of these organizations like Google App-Engine, Amazon EC2 and Windows Azure which are capturing the market with their simple use, availability aspects and utility computing model. Users need not be worried about the dependencies of distributed programming as they are taken care of by the cloud providers. They're going to devote more on their own domain work rather than these administrative works. Business organizations are showing increasing interest to indulge themselves into using cloud services. There are many open research issues during this domain like security aspect within the cloud, virtual machine migration, addressing large data for analysis purposes etc. In developing counties like India cloud computing are applied within the e-Governance and rural advancement with great success. Although as we've seen there are some major issues to be solved to successfully deploy cloud computing for these social purposes.

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