

ROLE AND ITS CHALLENGES OF CLOUD COMPUTING REAL TIME APPLICATION IN DIFFERENT FIELDS: A SURVEY

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Abstract

This computing is, one of the most exciting developments has become omnipresent among the technocrats world over as a technology justification. Occasionally it is compared with the virtualization of computing power, applications and storage, thought of as a model to deploy pay-as-you-go web services or perceived to be similar to grid computing and shares characteristics with all of these technology paradigms. The new technology model is the use of computer resources (hardware and software) that are provided as a service over web. Following the use of cloud - shaped symbol it is named as cloud computing. This new technology has been coined as an umbrella term to describe a category of sophisticated on-demand computing services initially offered by commercial providers such as Microsoft and Amazon. This paper focuses on the impact of cloud computing in the various fields like Education, Agriculture, Bank, Healthcare and Business sector and how we can provide the quality and performance by using the above skill. Inside this article, we identify the strengths, weaknesses, opportunities and threats for the cloud computing account.

Keywords: NIST, Education, Agriculture, Bank, Healthcare, Business sector

Introduction

This computing is an extension of the concept of distributed computing - which is the process of running a program or application over many computers connected by net. Internet makes this process easily achievable even for the general customer. National Institute of Standards and Technology (NIST) defines cloud computing as: "a model for enabling and convenient, on-demand network access to a shared pool of configurable computing resources that can be rapidly provisioned and released with minimal management effort or service provider combination". Internet-based computing in which shared resources, software and information be delivered as a service that computers or mobile devices can access on demand examine. Cloud computing is already used extensively in education. Free of charge or low-cost cloud-based services are used daily by learners and educators to support learning, social interaction, content creation, collaboration and publish.

1) Cloud Computing in Education

Educational institutions throughout the World have become highly dependent on information technology to service their business resources. Maintaining a wide range of hardware and software require substantial, ongoing investment and the skills to support them all. The features of cloud computing and economies of scale are likely to mean an increasing shift away from institutionally hosted facilities. Services are increasingly provided using Internet technologies to staff and students are accessed from web. This kind

of services are offered cheaply or freely to education, often with much higher availability than can be provided by the educational institutions and organizations.

Benefits of Cloud Computing

a) Lower environmental impact

This computing enables educational institutions to reduce their own electricity consumption and, in theory, cloud providers should be able to optimize power usage over a group of consumers. Though it is not easy to obtain figures for power usage from cloud.

b) Concentration on core business

The advantage of cloud computing is that it allows institutions to concentrate on their core business of research and education. Universities and schools do not normally have their own sewage plants and power stations; similarly it can be argued that computing services are becoming commoditized and are handled better by organisations.

c) End user satisfaction

Aimed at end users, apart from better availability, there are other clear benefits of cloud-based services, particularly evident with the range of new applications being delivered. It contains the latest tools and features from innovative companies such as Google and Microsoft. Most of the students can use office applications for free without having to purchase, install and keep these applications up to date on their PCs. Opportunities for collaboration are greatly enriched. For that they do not have to worry about backing up or losing data as it should be safely stored in the cloud with large storage capacity provided for free of cost. Data is accessible to them from any location or from a range of devices such as their mobile headset.

d) Cheaper

We need to balance the upfront savings with ongoing subscription costs to determine actual savings. We can expect to reduce costs associated with server hardware, support and power intake and deployment.

e) Faster

Information-intensive computing in a cloud can be six times faster than in isolated data centres. Applications are quicker, compared to traditional incomes.

f) Greener

The goal of DOD is to “implement cloud computing as the means to deliver the most innovative, efficient and secure information and IT services in support of Departments mission anywhere”.

Risks of Cloud Computing

This computing is a new paradigm which is threatening to some individuals in foundations. Challenges of computing service personnel who may fear the consequences of their roles being subcontracted. Security is a major concern is around the security of facts.

Establishments may consider that their data is more secure if it is hosted within the association. Moving data to a third party for hosting in a remote data centre, not under the control of the institution and the location of which may not be known presents a threat.

2) Cloud Agriculture

Cloud agriculture introduces the concept of implementation of cloud computing in the Indian agricultural area. The situation intends to introduce cloud computing model with two core parts in that one. Monitor and fulfill user requirements with a user-friendly and faster approach, and the other one to store all relevant data in a centralized location - cloud computing.

Cloud Agro System

Cloud agro system can be used to monitor the overall functionalities of the system and render the needed facilities and Cloud agro system will have online service facilities available to all the users, from any part of the country and at some stage. The Agro system may have the following facilities.

1. **Demand-supply:** This system can provide an up to date picture of the current demand and supply information of agro products in different parts of the state and this system helps the farmers in deciding on selection of the crop, It also provides room to go for a comparative analysis of the demand and supply series.
2. **Communication Devices:** This system incorporates mobile services and helps the farmers in acquiring information from e-data bank from anywhere, at any time, through mobility.
3. **e-Knowledge sharing :** E-knowledge also keeps provision to have online communication with the experts/consultants and attend online training programs using the Community Service Centres (CSC) as the local information spaces.
4. **Conducting Research:** Conducting Research system will help the national and international researchers to extract Indian agricultural data directly from the e-data bank and analyse them in order to contribute to the Indian agricultural sector of the dominion and this kind of research findings will be kept in the e-data bank and will be available to all its stake storage.
5. **e-Data Bank:** e-databank central data bank and it can be used to store all the agriculture related information in a centralized cloud, which will be available to all the users at any cost in anytime.
6. **Weather information:** Weather information stores the region specific weather information and also the weather forecast for a specific time.
7. **Farmers Data:** This data captures the region wise farmer related data, to monitor and study the involvement of local farmers in Indian agricultural section. This data will help the policy makers in designing Indian agricultural system .

Farmers data will also help in identifying the core Indian agricultural areas, so that the policy makers can take decision on encouraging and promoting agricultural science. It may help in overcoming problems such as unemployment and rural-urban movement.

Advantages of Cloud Computing for rural India

- **Low start-up cost** makes Cloud computing especially attractive for rural places in India
- **Ease of management** - There is no concerns about procuring licenses, or for that matter, power and air- training
- to **run** the data centers, or purchasing additional hardware resources.
- **Scalability** makes rapid rural penetration a reality; one can easily expand the number of users and locations at a modest price.
- **Device and location independence** By the way of you access a Cloud, could be in front of PC. This could be a smart phone or solar powered touch device.

3) Cloud Computing in Healthcare

Benefits of Cloud Computing for Healthcare

- **Clinical Research:** Pharmacology vendors are starting to tap the cloud to improve research and drug growth.
- **Electronic Medical Records :**Physicians and hospitals are starting to see cloud-based medical records and medical image archiving services coming on line over web.
- **Collaboration solutions:** Original successes of cloud-based physician collaboration solutions such as remote video conference physician appointments. Cloud technology supports collaboration and team-based care delivery and the ability to use applications based on business model requirements and a common set of clinical particulars.
- **Telemedicine:** Telemedicine increase the availability of mobile technologies and intelligent medical devices, telemedicine has grown to include not only tele-consultations and tele-surgeries, but also health record exchange, a video-conferencing and home monitoring.
- **Big Data:** It turn to cloud computing to save on the costs of storing hardware local environment.
- **Health Information Exchange :** Health information exchanges help healthcare organizations to share data contained in largely proprietary EHR schemes.

4) Cloud Computing in business

a)Google

Google's App Engine offers client organizations access to Google's cloud-based platform that provide tools to build and host web presentations.

b) Microsoft

Microsoft company has scheduled Windows Azure, the “cloud operating system” PaaS to appear in early (2010) days. Moreover they are creating the Azure Services Platform to run on the Windows Azure operating.

d)AT&T

It provides two cloud services: Synaptic Hosting, through which client companies will be able to store Windows server, Linux client server applications and web applications on AT&T's cloud Synaptic Storage, enabling clients to store their data on AT&T's cloud environment.

e)Apache

It is an open-source software framework that has inspired the development of database and programming tools for cloud computing environment.

f)Cisco

Cisco is relatively late applicant in the cloud computing space, Cisco is actively working on a set of standards that will allow portability across suppliers.

g)Amazon

Amazon Offers its Amazon Web Services, a suite of several services which include the Elastic Compute Cloud (EC2), for computing capacity, and the Simple Storage Service (S3), for on-demand storage ability.

h)SalesForce.com

It is the first well-known and successful SaaS presentation. Integrated set of tools and application services that independent software vendors and corporate IT departments can use to build any business application and run it on the same infrastructure platform.

i)ECP

ECP (Enomaly's Elastic Computing Platform) integrates enterprise data centers with commercial cloud computing offerings, letting IT professionals manage and govern both internal and external resources from a single comfort.

5) Cloud Computing in Banking Sector

It has experienced a fast growth during the last years, and it is expected to keep developing more and other. Banking sectors are an important segment of business area that cloud computing is targeting in the next few centuries. We have many advantages that cloud provides for banks as customers.

Initially, cost savings, using cloud-servers instead of personal servers, will save a lot of cash. Additionally, cloud provides: usage-based billing, business agility, green IT sector, business continuity. Hence, nowadays cloud computing services has some disadvantages that stops banks to adopt the cloud, such as security, confidentiality of the data, and also quality of facilities.

Banking Industry Trends: Whatever the banks do not understand, and it is difficult to switch to another way to run things, is that the customer can't be organized. The new banks using online platforms for its consumers. It need to look at the things from the outside, from the point of view of the consumer, to change something in the banking scheme. Proposing services that best fits the character and needs of each individual, banks want to replace the information offices and lines. Reserved cloud has come to dominate core funding sector. Banking sectors are aware of the potential security breach or disruption in areas such as transactions and withdrawals. It must keep its core banking processes under control in their database.

Advantages of banking field

- **Reduced costs:** cloud banks do not have to invest so much in the software, hardware and worker.
- **Highly flexible:** This platform provides the ability to respond quickly to market changes, customer needs but also to respond quickly technological way
- **Faster customer service:** Cloud services and products developed and released simply. Banking will be able to increase computing power to meet peak demand without having to improving expertise.
- **Relationship between customer and bank:** Combination of Big Data and unlimited computing power will allows to banks to develop systems that will make better decisions for their customers.
- **It brings customers closer to the banks:** relations between buyers and sellers will be done easily at the time.

6) Cloud Computing in Library

Automation

At present automation in most of the libraries are carried out on local servers by using different types of commercial or open source integrated library management software and managed by internal IT / library staff. Now many software vendors (e.g. Ex-Libris) offer this on the cloud (SaaS model) which enables the library free from investing on hardware and undertaking maintenance, software updating and backup.

Website hosting Libraries

It can host their own websites with the help of cloud technologies. Most of the libraries prefer to host their websites with third party service providers rather than hosting

and maintaining their own servers due to dearth of required technical manpower to maintain the servers side. District of Columbia Public Library is using Amazon's EC2 service to host their website and provides rapid scalability and redundancy to libraries.

Search Services

By using commercial or open source solutions libraries have already migrated key services such as Open URL providers, and federated and pre-indexed search engines on the cloud environment. Hosted Ex-Libris SFX Open-URL link resolver service offers libraries to linkup to the subscribed journal full-text papers. Using Open URL Ex Libris' SFX provide library patrons with context-sensitive links, such as the ability to move quickly from a citation in an abstracting and indexing database to the full script. Information for determining the appropriate links is maintained in the knowledge base, which contains details about a library's electronic holdings and other information about electronic information properties.

Storage

Libraries store and access the electronic documents, bibliographic records, tutorials. Personal desktops or servers which are locally presented. Cloud computing has brought new services, which even offer space at no cost to store documents and the files. The digital library services are being offered by libraries mostly using locally hosted open source software such as DSpace, Greenstone, EPrints, Fedora Commons for providing open access to scholarly properties.

Advantages

- **Cost effective:** Cost is reduced in terms of manpower, material, running charges.
- **Reduces storage space:** There is no longer restricted by our computer's limited storage space. We can simply save our data in the cloud and log in to view and edit it as required.
- **Reduces hardware and maintenance cost:** No need for the user to invest in high end software and hardware or be tied to constant upgrade cycles as cloud based services utilize hardware and software on the cloud environment.
- **More computing power:** It is done on cloud, and hence large scale computations can be managed by better technologies.
- **Round the clock access from anywhere:** Chief benefit of Cloud application is around the clock availability; all you need is an Internet connection with right authentication details and you can access whenever without any geographical locality.
- **Infinitely scalable:** Most of the users can access the resources they need in line with their changing resources.

- **Automatic and secure data backup:** Evaluation suggests that about 80,000 laptops are lost every year at airports only. Backup of data ensures that you do not lose just more than your PC.
- **Increased collaboration, faster provisioning of systems and applications:** This solutions also allow exchanging enormous data and documents more easily and efficiently than ever earlier.

Disadvantages

- **Need for Constant connectivity-** Some of the major drawbacks of every cloud service is the need for constant connectivity with web.
- **Complexity-**Though cloud services enhance and ease library performance they are initially complex to know.
- **Latency** - Based on cloud apps will have higher latency than the native apps installed on a users system since there will be an added time of user end communicating with the cloud environment.
- **Security-**This computing is completely Internet based and all cloud based computing uses and stores data using the same network which makes it vulnerable to attack by intruders.
- **Privacy-**This kind of loss is a big concern when we talk about cloud-based facilities. Information stored or shared on the cloud by large social networking sites are usually protected and can be accessed by only authorized people, but there is always a chance of accidental data leakage, failures.

Conclusion

The cloud allows us to access our work anywhere, anyone and share it with anywhere. Here the present paper a cloud education system is introduced and how it is beneficial for students, faculty and the educational institutes for providing quality teaching Constant advancement of cloud computing within the banking sector will require vendors and banks to overcome its challenges prearranged. Cloud reflects on the adoption of cloud computing in companies and what are the opinion. This new computing has on the business and how the service providers are competing between them on this market, so that they could become market leaders with the help of the services and products obtainable. Useful implementation of this model will encourage other sectors also, which will lead to optimal benefit of shifting towards cloud progress. It will bridge the gap between technology, information and farmers. This will have positive and tremendous impact on further fields also that will lead the nation towards technological progress.

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Biography

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