Cloud Computing: A Revolutionary Concept or Overhyped Trend

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Abstract: *Cloud computing has transformed IT operations by providing scalable, cost - effective, and flexible solutions. This paper explores cloud computing's benefits, challenges, and impact on Management Information Systems (MIS). The discussion includes various cloud service models (SaaS, PaaS, IaaS), security concerns, cost considerations, and managerial challenges. While some believe cloud computing is a revolutionary shift, others argue it is an overhyped trend. This study provides a balanced perspective by analyzing cloud computing's potential and limitations*

Keywords: Cloud Computing, Information Systems, Security Challenges, Cost Efficiency, SaaS, PaaS, IaaS.

1. Introduction

Cloud Computing has become the ideal way to deliver enterprise applications and the preferred solution for companies extending their infrastructure or launching new innovations. Cloud Computing simplifies the management of infrastructure and reduce the overhead. It has been established as commonplace that cloud computing changed the way we transport data on digital avenues. Cloud computing also reduces costs and helps organizations deliver solutions faster. However, some organizations believe that cloud computing is overhyped and risky for critical applications. Cloud computing has emerged as a paradigm to deliver on demand resources (e. g., infrastructure, platform, software, etc.) to customers similar to other utilities (e. g., water, electricity and gas). It is based on five attributes: shared resources, massive scalability, elasticity, pay as you go and self - provisioning of resources.

Cloud Computing is very relevant topic to today's world and I believe that it's important to understand Cloud Computing in detail before anyone makes the decision to move to cloud. Additionally, it is also important to clear all the misconceptions about Cloud Computing.

In the coming section of this project, I would be discussing Cloud Computing in detail, various types of offerings of cloud computing, benefits, challenges, arguments, manager's role with cloud computing. I would also cover my opinion about this important topic of Cloud Computing.

The purpose of this study is to analyze the role of cloud computing in modern information systems, evaluate its advantages and challenges, and determine whether it is a revolutionary shift or an overhyped trend.

Understanding cloud computing is crucial for organizations aiming to optimize IT resources, reduce costs, and enhance security. This study highlights key aspects that can guide businesses in making informed decisions about cloud adoption.

Overview of MIS Issue

Management Information Systems (MIS) involve the use of set of protocols which are applied on data/information to generate intelligent business solutions. MIS along with cloud computing is unfolding vague patterns, inventing new ideas and ensuring business success. Cloud Computing is the new model for fulfilling IT needs of an organization. One of the main important benefits of Cloud Computing is the agility it brings to the organizations' information system. It is suggested that emerging cloud technologies are changing the traditional information systems development processes, leading to significant changes to systems development service provider paradigms. The cloud architecture has changed the way development service providers do business. Migration to Cloud Computing predicted to have a positive significant impact on organizations operating environments facing budget constraints. Cloud Computing brings many benefits to manage information system on any organization but on the other hand it also brings some challenges related to managing the information systems. Some of the challenges are:

- IT Budget Management
- Roles & Responsibilities of various business units
- Managing Cloud Computing Projects
- Data Security
- New Security Controls
- Changes in Existing Security Controls
- Training and Awareness
- New Architecture and Infrastructure
- Aligning the Cloud Computing to Information System Triangle

All the above listed challenges are new and will have a huge impact on Information System of any organization, so it's important for the leadership to take proper steps to overcome these challenges so that Cloud Computing can generate positive results for the organization.

2. Background of Issue

There is no doubt that cloud computing significantly impacts Management Information Systems. Some of the affected areas include IT investment, roles and responsibilities, architecture, security, infrastructure, governance, and project management.

Earlier an organization needs to have multiple teams with clearly defined job functions but due to Cloud Computing, roles of the people working in information systems including developers, project managers, IT support, administrators are getting changing because some of the functions are performed and owned by Cloud providers or vendors.

Considering reduced cost of Cloud Computing, IT investment budgets are cut by leadership which also impacts the decision-making process. Technologies used in Cloud Computing like virtualization, distributed storage, parallel programming model, data management has impacted the main pillars of Information System i. e. architecture & infrastructure. As Cloud Computing is new to many people, it requires new trainings and education for people who will be using it. People also need time to learn this new technology. New Information System also needs new security polices around usage of Cloud Computing infrastructure. Cloud Computing will be available over the internet so proper security measures need to be deployed. This also requires changes in the existing security controls.

Let's consider an example to understand this in detail. There is an application which is deployed on premise network which is protected by firewall and other security controls. Considering the risk associated with the application and other security controls deployed for on premise solution, 2FA is a sufficient solution for that application but once this application is deployed on Cloud, risk associated with the application also increases and organization may consider using MFA solution to protect the same application. This new MFA solution require more money to deploy the solution i. e. impact on IT budget, this new solution will require changes in architecture, new infrastructure will be required, new trainings will be required for employees.

This small application is touching each and every branch of the Information System of the organization. Now if organizations move most of their infrastructure or applications to Cloud then you can imagine the impact on entire Information System of the organization.

These days Cloud Computing is a buzzword that means different things to different people. For some, it's just another way of describing Information Technology; others define it to mean any computing service provided over the Internet or a similar network; and some define it as any bought - in computer service you use that sits outside your firewall some just think that it's just a bubble which will burst soon. However, I define cloud computing, there's no doubt it makes most sense when we stop talking about abstract definitions and look at some simple & real examples—so let's do just that.

Many people use cloud computing daily without realizing it. Google Document is the perfect example of Cloud Computing. We create document in Google drive and share with others. People from different geographical locations can contribute to that document. Netflix, Google Photos or Dropbox are other examples of Cloud Computing. According to me Cloud Computing is a synonym of **Collaboration**.

Cloud Computing is the delivery of on - demand computing resources, applications to data centers, over the internet on a pay as you use basis. Organizations from the world are adopting Cloud Computing in recognition of its potential to usher in a new era of effectiveness, responsiveness and efficiency. Before we discuss more about arguments related to Cloud Computing, one needs to understand:

- What is Cloud Computing?
- What does it offer?
- What are the benefits?
- What are the risks?

Let's discuss these one by one or I would say let's go to Cloud.

Cloud Computing offers various types services like PaaS, SaaS & IaaS. These services fulfil all the IT related needs of any organization which means organization can completely leverage Cloud Computing for their Information System

SaaS:
This is known as Software as a Service (SaaS). This is a way of delivering applications over the internet as a service. Instead of installing and maintaining the software, organization can just access the software and start using the same without any hassle. Some of the examples of SaaS are Salesforce, ServiceNow, Oracle EBS, Oracle IDCS, Okta etc.

PaaS:
This is known as Platform as a Service (PaaS). A PaaS vendor provides hardware and software tools over the internet, and organizations use these tools to develop applications. PaaS users tend to be developers. This is the most used offering of Cloud Computing.

IaaS:
This is known as Infrastructure as a Service (IaaS). Cloud Computing offers infrastructure as a service to organizations. This allows organizations to buy servers, processing power, storage and networking from the Cloud providers. It allows businesses to purchase resources on - demand and as - needed instead of having to buy hardware outright

Benefits of Cloud Computing
Cloud computing offers numerous benefits. These benefits are the reason, each organization wants to move them on premise applications, software's, infrastructures to Cloud as soon as possible. Some of these benefits are described as below:

Speed to Market
Once organizations buy hardware, it takes time to ship, install and configure hardware. Sometime this takes several weeks and sometimes it takes several months to setup. Now when it comes to software, it takes time to setup OS, install software and to do network configurations. When it comes to cloud, you can order the hardware and software (OS, applications) in just few clicks. A person with limited knowledge can order this for the organization if that person knows what to order. This can help in taking your products/applications to the market as soon as possible but saving the time which is required for hardware, OS, software and networking.

Flexible Cost
Cloud Computing can reduce IT investment every year. Cloud Computing works on pay as you use model which means you need to pay according to your usage. It's easy to turn - off and turn - on the services in the automated fashion or manually when are not in use. An application which requires 100 instances during the festival or holiday season

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but requires only 30 instances on the remaining days then business can buy 100 instances only during the peak seasons and pay accordingly. Organization is not bound to buy 100 instances for the whole year but if business have on premise solution for this then organizations may have to main 100 instances throughout the year which is a wastage of money.

Latest Technology
In Cloud Computing, organizations can always get access to latest technology without worrying much about the cost. It's difficult for organizations to maintain the latest technology in - house for all the hardware and software. Support organizations are using Windows Server 10 VM in cloud and now they want to move to Windows Server 2016 then they can shut down the 2010 instance and create a new instance of 2016 but if you compare this case with on premise setup, organizations need to buy the new instance of 2016 and 2010 is no longer useful for them.

Availability
Availability is one of the most important benefits. Cloud Computing is available over the internet and available in each and every zone. Some vendors offer 99.99% availability for their services which is challenging to meet with on premise setup. Cloud Computing is designed in such a way that it offers great availability. Availability provides brownie points to any business.

Data Security
Data Security is one of biggest challenge for any industry and Cloud Computing vendors assure security of your data. Once organization start using Cloud Computing, they can give this burden to Cloud vendors. Vendors have installed proper majors to secure the data of their customers from the hackers. All the latest patches are the responsibility of the vendors.

Collaboration
Cloud Computing allows people to collaborate from different parts of world. It makes people work easy and promotes collaboration among employees which result into better results for organizations. History is the witness that team work is one of the major factors behind success of any organization and an organization doesn't need more than that their employees are collaborating. This also improves productivity and with higher employees' satisfaction rate.

Reduced Expenses
Cloud Computing also helps in reducing expenses of organizations. To setup on premise infrastructure, organization needs building for data center, a force of IT experts (infrastructure teams, hardware teams, software teams, application teams, support teams), laptops & accessories for the IT force etc. To manage these teams, they need leadership in each area for better IT governance. Once organization start using cloud computing then these expenses will be reduced. Organizations no longer need so many IT experts because most of the IT services will be taken care by the Cloud vendors.

Reduced Environment Impact
After using the Cloud Computing, organizations are no longer worried about environment impact like tornado, earthquakes, cyclones etc. If organizations don't use the Cloud Computing,

organizations can have only limited number data centers and this number varies based on the organizational needs. Cloud Computing's design and architecture is spread across the world and that's why vendors offer 99.99% availability. They have considered the environment impact while designing the Cloud Computing architecture.

As you see that, Cloud Computing has a huge list of benefits but some people still think that Cloud Computing is just an overhype. They also believe that

Cloud Computing – Revolution or Hype
Many people believe that Cloud Computing is just an overhype. Cloud Computing can't solve all the problem which an organization is facing related to their Information Management System. To some extent I am in the agreement of the statement but I don't in the agreement that Cloud Computing is just a hype. Let's discuss all these arguments one by one:

Argument: More Risks
Some people think that Cloud Computing brings more risk to their business. The moment we expose our applications over internet, it increases the risk multiple times. Some applications which are meant only for internal employees, why should we expose over internet and increase the risk.

Argument: Costly in Long Run
Another argument which was raised related to one of the benefits of Cloud Computing i.e. "Flexible Cost". People believe that Cloud Computing doesn't reduce the cost in long run. The number of applications, software & hardware which a company need is very large. If an organization has to buy these many services from a cloud vendor for many years, then they will have to pay much more than the actual cost of those resources. Let's consider a very basic example of an external hard drive. A 3TB external hard drive costs me USD 80 – USD 100 which I can use for many years but if I have to use cloud service to store 3 TB for 5 years, it will cost me much more than USD 100. It's just an example of small storage hard drive, anyone can compare the cost for an organization.

Cloud Computing offers flexible cost so someone needs to really work hard in understanding the business needs and save the money of the organization. Considering the same example of hard drive, at the time of travelling, someone needs to carry that hard drive everywhere. This also adds risks of damaging the hard drive or may add additional cost of hard case for the hard drive. If we consider all these, cost will not be increased significantly. Another example, AWS provided various types of storage services like glacier. One can more file which are not accessed frequently to Glacier which can reduce the cost.

Argument: Dependency on Network Bandwidth
People also believe that Cloud Computing makes them dependent on network band width. Someone always needs high speed internet to access their files or applications which is not the case when things are deployed on premise.

Agree with this argument that we become dependent on Network Bandwidth but this can be treated as one of the benefits of Cloud Computing. Files, applications or tools can be accessed from anywhere in the world. Internet is available

to everyone in today's world in less prices with very good bandwidth.

Argument: Security

Security of data was another concern raised by some of the people. Still the financial organizations are reluctant to move to cloud. Considering the nature of their business, they don't really trust the security provided by Cloud Computing vendors. Even if vendors are ready to take complete responsibility of the data, they don't want to move to cloud. They say in case of data breach vendors may be able to handle financial loss but the impact on the brand & reputation is much bigger than the financial loss because this can impact their business for many years.

I have experience of working with financial companies and I totally understand their concerns but it doesn't mean that financial organizations can't leverage the benefits of Cloud Computing. They can leverage benefits of Hybrid Cloud Computing. Critical applications can be deployed on premise and low risk applications can be deployed over Cloud or they can use Private Cloud. Also, they can implement IAM, 2FA, MFA, Encryption in Transit, Encryption in Use and Encryption on Rest solutions to secure their data.

Argument: Vendor Dependency

No doubt that cloud computing makes us dependent on the vendors. If an organization is using the Cloud services from a vendor, willingly or not willingly they become dependent on the vendors and their policies. Sometimes this can impact the organization. Switching from Cloud vendors adds risk to business which no organization wants to take.

To avoid such situations, it's really important to negotiate with the Cloud providers at the time of signing the agreement. I would recommend to consult with the legal team and review the agreement multiple times before making decisions.

Argument: Loss of Control

Trusting another party to take care of your data. You are trusting that they will maintain their data centers and servers with the same care as you would, if not more. You have to trust that your provider's data centers are compliant and secured both physically and online

Cloud Computing – Managers' Challenges/Role

Every manager makes many decisions every day and contribute to Information System of the organization. Decision about Cloud Computing is one of the main decisions for managers these days. Many organizations are exploring Cloud Computing for their IT needs but leadership needs their managers to evaluate the organization needs and map the same with various services of Cloud Computing. Leadership also wants managers to assess the risk which will be coming along with Cloud Computing.

Managers play a vital role for decision making so it's important for manager to consider all the risks related to Cloud. Here are the few examples of challenges which are faced by managers before making any decision related to Cloud Computing:

Pressure to Manage Spending

Everyone knows that Cloud Computing helps in reducing the cost of Information System. Cost is one of the major reasons behind using Cloud Computing for IT needs. There's no doubt that Cloud Computing reduces the cost but this is not completely true. Cost will be reduced only if someone uses the Cloud Computing efficiently. Consider an example of an organization which operates only in United States. In the day time, organization needs 50 instances of their applications but in the night time they just need only 5 – 10 instances, so organization needs to find the best model which fulfil their needs. They must shutdown the instances in the night time to save the money. If they keep on using 50 instances even in the night time, cost will not be reduced, so managers need to find the best model of Cloud Computing according to their needs.

Hiring the Right Talent

Cloud Computing is relatively new concept and it's hard to find the talented resources in the market. Managers are facing lots of challenges when it comes to hiring the Cloud Computing resources who can help in taking the organization in the right direction. People are still learning this new technology and market has shortage of resources, so managers end up hiring people with limited knowledge which, sometimes, result into frequently changes in Information System.

Selection of Vendor

There are many leaders in Cloud Computing like Amazon AWS, Microsoft, Google, IBM, Oracle etc. and every vendor offers various similar and different services. It's becoming difficult for managers to choose the right vendor which can fulfil the business needs. Sometimes managers choose one vendor and later they have to shift to another vendor because of the limited features from the selected vendor.

Managing Relationship with Vendor

This is another challenge which is faced by managers related to Cloud Computing. In Cloud Computing, organizations are dependent on the vendor for the issues related to their services but organizations are bound by the Service Level Agreement signed between both the parties so managers need to build a good relationship with the cloud computing vendors.

Cloud Computing Project Management

There's another challenge which is faced by today's managers with Cloud Computing i. e. project management of cloud computing related projects. These projects ae little different than other in - house IT projects. Managers need to understand the cloud collaboration tools & techniques. For a migration project, they need to understand the existing applications & architectures.

As I said earlier, managers' position is very important when it comes to Cloud Computing. Because this is a new concept, managers are also learning and educating themselves.

3. Conclusion

Cloud computing continues to reshape IT landscapes by offering scalability, cost efficiency, and flexibility. While concerns regarding security, cost, and vendor dependency remain, careful planning and hybrid solutions can mitigate

these risks. This study concludes that cloud computing is more than just a trend it is a fundamental shift in how businesses manage their IT infrastructure. Organizations must evaluate their specific needs and challenges before migrating to the cloud.

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