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# Adoption of Cloud Computing in BFSI Industry

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**Abstract:** *In today's world cloud computing is a huge leap in technology and there are various reasons behind them. BFSI [Banking Finance Service and Insurance] industry comprises of companies that provide range of services and products. In this paper we are going to find out what is the percentage of cloud computing been used in BFSI and if they do not use the cloud services then what are the possible reasons behind not using the cloud computing services.*

**Keywords:** *Cloud, Computing, Banking, Finance, Service, Insurance, Public Cloud, Private Cloud, Hybrid Cloud, Micro services*

## I. INTRODUCTION

Cloud Computing is the technology which is heard very often is been used by many sectors recently in huge numbers. Now we will discuss what is cloud computing and what makes everyone go behind the technology. Cloud Computing concept is being used from long time with a different name and purpose.

There are many resources which are been used by IT industry that will include resources like storage, computing power for which industry spends a lot is now available on demand and which can be used through Internet. [9] Making use of cloud computing gives user a better control over the resources need to be used. The resources are auto scalable, the user just need to pay as you go which is significantly cheaper when compared to buy all the resources setting it up and their maintenance. These cloud-based computing is very robust when very less down in modern time. [12]

Even in case of natural calamity cloud will always give you backup from its other centres. Cloud isn't fixed to a single place it is distributed throughout the world and have multiple replicated data center of its own. BFSI [Banking, Financial services and Insurance] this is an industry which provides range of financial products that comprises of insurance companies, commercial banks, non-banking financial companies, co-operatives, stocks, financial trades, core banking, stock trading, mutual funds, insurance, credit, corporate investment these methods of banking will require products to be developed so that the investment and documentation can be tracked. [10]

Today's in modern era banking is not totally IT oriented they still use old way of banking which is nearly 30 years old and still do most of the thing on paper. IT is a very small sector in banking system still used to do basic stuff. Slowly and steadily banking system and undertaking the use of IT Infrastructure for their banking usage. [2] But they use in house infrastructure which obviously need a lot of basic investment and maintaining it is other investment need to be done. [11] There is obviously rapid increase in the IT solutions as banking going for more demanding products and management application where they are using Data Warehousing and Business Intelligence and a lot of analysis is done before developing a banking solution that will be both for normal customers and corporates. With this rapid development banking IT solution need to change at that speed.

## II. LITERATURE REVIEW

Cloud can be built by anyone who wish to build them. It requires a lot of initial investments which are generally available with big businesses. Recently few of the major companies which hold the cloud business are mentioned below –

- 1) Amazon Web Services
- 2) Kamatera
- 3) Microsoft Azure
- 4) Google Cloud Platform
- 5) Adobe
- 6) VMware
- 7) IBM Cloud
- 8) Rackspace
- 9) Red Hat
- 10) Salesforce

- 11) Oracle Cloud
- 12) SAP
- 13) Verizon Cloud
- 14) Navisite
- 15) Dropbox
- 16) Egnyte

**A. Why to use cloud computing?**

What is the advantage of using it?

Answer to this is the features which the cloud computing is providing that's what gives an edge to this technology.

- 1) Great Availability of Resources
- 2) On-demand Self-service
- 3) Easy Maintenance
- 4) Large Network Access
- 5) Availability
- 6) Automatic System
- 7) Economical
- 8) Security
- 9) Pay as you go

**B. Cloud Can Be Modelled Into Four Types**

- 1) **Public:** This cloud is open to all customers. The location the same but have separate customers and have no physical control over the infrastructure. [4] They use shared resources within themselves. The security is bit at weaker side.
- 2) **Private:** These cloud provide the same benefit that of public cloud but is dedicated with private hardware. This means that this system is built only for the customer who is going to use it, though it can be remotely located. They have option to choose on premise private cloud which is more expensive but have full control over physical infrastructure. The security and control is highest but cannot have any cost reduction. [4]
- 3) **Hybrid:** Combination of private and public clouds, depending on the usage of the customer. In this customer have choose what are the ways in which public and private will work e.g. – data can be securely worked out with private cloud whereas the less important can be used by public cloud. [4] This also depends on the cost and the features required by the customer.
- 4) **Community:** This cloud infrastructure is shared between organization which have connection between them and have to use same data to work on.

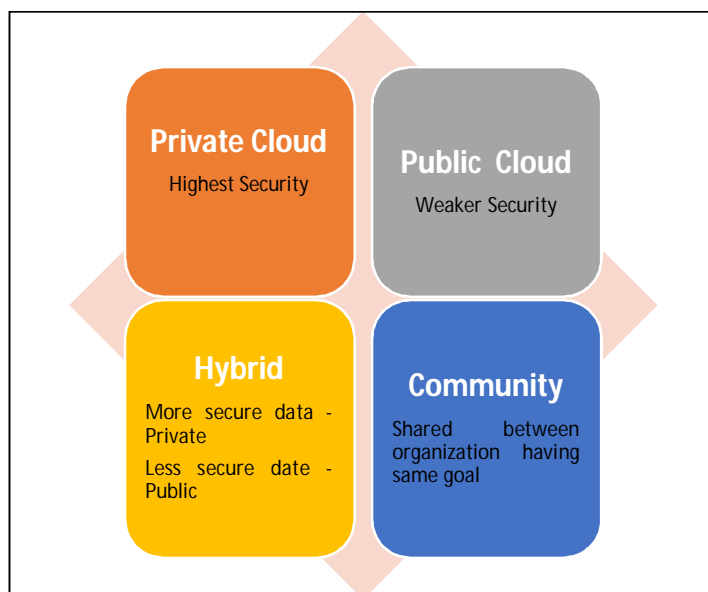


Image 1: Types of Cloud with respect to Security

C. Now let's discuss what can we really do with cloud computing and check out its types:

- 1) *IAAS [Infrastructure as a Service]*: IAAS is a basic type of cloud computing which allows you to rent IT infrastructure from cloud provider on pay as you go basis. [7]
- 2) *PAAS [Platform as a Service]*: PAAS provides on demand environment for developing, testing, delivering and managing software applications. [7] It is designed to quickly create web or mobile applications without worrying about setting up or managing the underlying infrastructure.
- 3) *SAAS [Software as a service]*: SAAS provides software application over internet as per demand and on a subscription basis. Helps you host and manage the software application and its infrastructure. [7]
- 4) *FAAS [Function as a service]*: FAAS is another layer of abstraction to PASS so that developers are completely insulated from everything in stack below their code. [7] Instead of handling the hassles of virtual servers, containers, and application runtimes, they transfer narrowly purposeful blocks of code, and set them to be triggered by a precise event. FAAS applications do not consume IaaS resources until an event occurs, which helps reducing pay-per-use fees.

#### D. *BFSI [Banking Finance Service Insurance] Industry*

With internet banking becoming a big scope for banking use of technology like cloud computing are taking steps into becoming their main IT solution partner. [2] Cloud computing in banking sector is a big deal where banking sector will be benefited with cost reduction, availability of unlimited storage and computing power, there are many AI which are available to be worked on. The many cost reduction is walk away with old infrastructure.

With cloud there is no need to worry about the infrastructure and its scalability, availability. Cloud in recent time has very less downtime and various companies are present to support with next gen technology to keep up every time. Banks need to pay only for the usage which depends on banks. [3]

New financial solution can easily start with cloud computing as they have less resources needed with ease to grow. With old financial solutions they can upgrade to new cloud technology.

BFSI industry also have reasons to not to enter into cloud computing sector for majorly two reasons and they are 1. Security and 2. Rules and regulations.

- 1) *Security*: Security is the many concern with BFSI industry and your data is stored into the cloud which no one knows where is it. And clouds are not totally securing as many hackers are trying to hack the cloud and they are increasing in number in due time. [5] A lot of information is available which becomes the biggest risk for BFSI industry which for obvious reasons they cannot afford to take it.
- 2) *Rules and Regulations*: Government rules and regulation is the second aspect that stops the banking industry to use cloud system. Government defines the way banks need to perform. Most of the cloud and spread around the world and they may be restricted to operate within the country. To take services which are available in the country.

With this said banks can divide their system into various parts banking solution.

These banking solutions can be spread into different categories e.g. core banking, banking products, customer services, stock trading, data storage, etc. according to the categories cloud implementation can be performed. [8]

Cloud gives three modes to implement those are

- a) Public
- b) Private
- c) Hybrid

Making use of these can help them separate their solutions and make best use of the cloud system and choose companies providing them depending on the cost they are providing the services for.

[4] For a very high security banking solutions they can use private cloud and for solutions which require less security they can opt for public cloud. [10] When they need to have both public and private they can opt for hybrid systems.

### III. METHODOLOGY

For this research, we had done a survey on cloud computing and its usage in the BFSI industry. Here is are the Questionnaire for the adoption of Cloud computing in the BFSI industry Survey, Table 1.

Sr. No.	Questions
1	What is your role in the company?
2	What is the type of your company you are working in?
3	In which banking sector are you working in?
4	Is your company using any cloud services?
5	What type of cloud computing does your company use?
6	What percentage of cloud services are used in your company?
7	Which cloud computing services is your company using currently?
8	What are the reasons for not having other cloud services?
	Section 5: Reason for not having Cloud Services
9	Reason for not having cloud services?
10	Is your company planning to use Cloud Services in future?

Table 1: Survey Questions



Chart 1: Summary Response for Role in the Company

The Survey had been taken by the people from various fields with the industry like Research Associate 3.1%, Process expert OTC 3.1%, Independent consultant 3.1%, academic instructor 3.1%, Software engineer 37.5%, cloud specialist 6.3%, solution architect 3.1%, project manager/business analyst 15.6%, senior managers 6.3%, executive level c 18.8%, as per Chart 1.

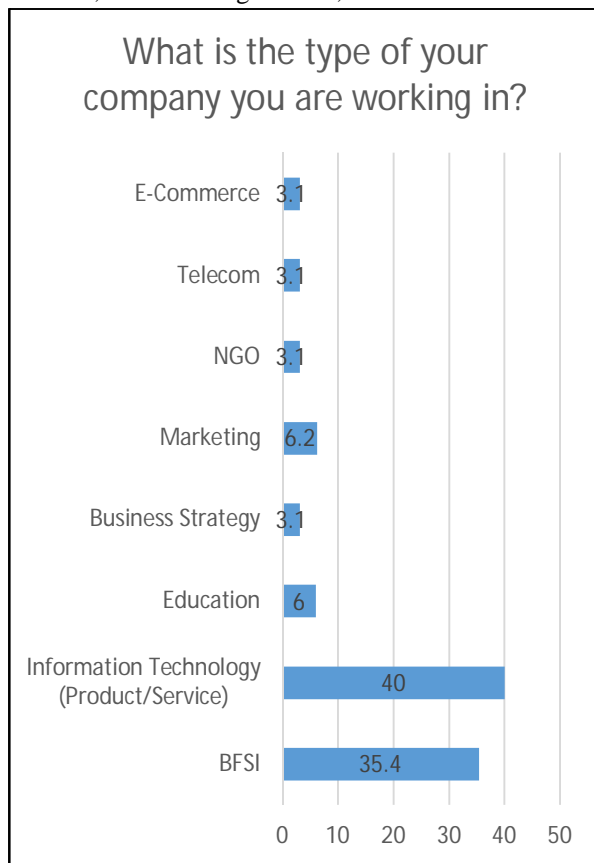


Chart 2: Summary Response for Type of the Company

Survey taken by the people work in companies like Ecommerce 3.1%, Telecom 3.1%, NGO 3.1%, Marketing 6.2%, Business Strategy 3.1%, Education 6%, IT 40%, BFSI 35.4%, as per Chart 2.

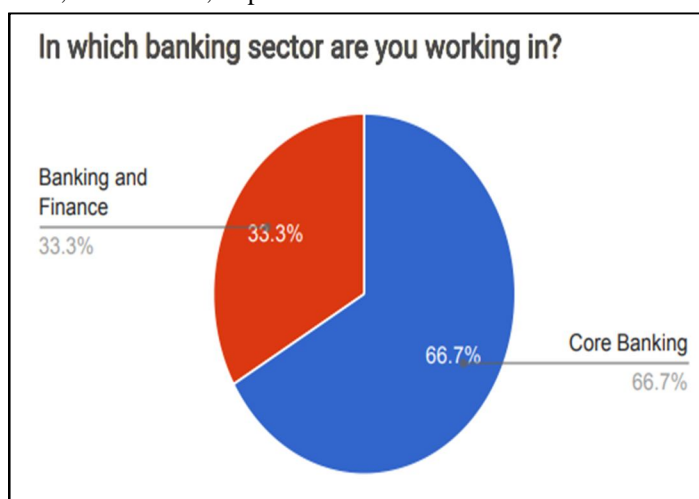


Chart 3: Summary Response for Type of the BFSI Sector

BFSI sector is very vast which includes many divisions like core banking, Industrial finance, Insurance, Stock, Mutual Funds, Investors, etc. the above image describes the people working in which sector of BFSI where 66.7% are working in core banking sector and 33.3% are working in banking and finance sector, as per Chart 3.

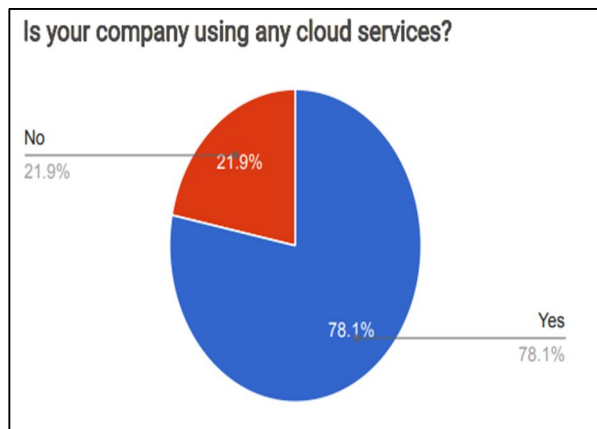


Chart 4: Summary Response for Cloud Service Used or Not

Cloud services usage is described in Chart 4, where more than 78% companies are already into the cloud services. Whereas nearly 22% of the companies do not require these services as they may be small scale for them these services will be bit expensive or they have no skill to how to manage these services, as per Chart 4.

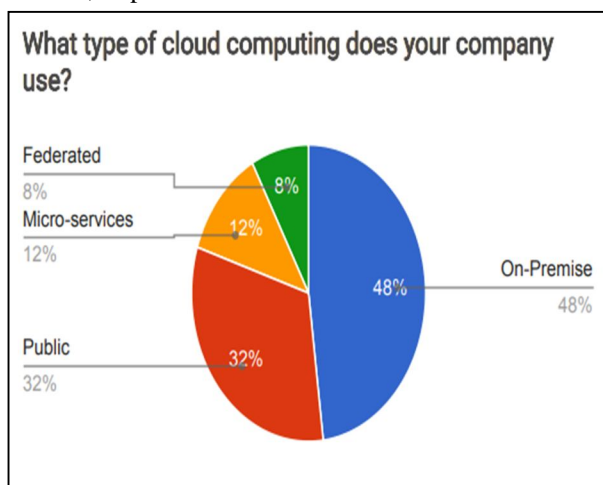


Chart 5: Summary Response for Type of Cloud Services used

There are many types of cloud like on premise, federated, micro services and public, on our survey, the percentage varies from 48% for on premise, federated has 8%, micro services for 12% & public for 32%. The percentage nearly depends on company and what is the reason of the cloud usage, as per Chart 5.

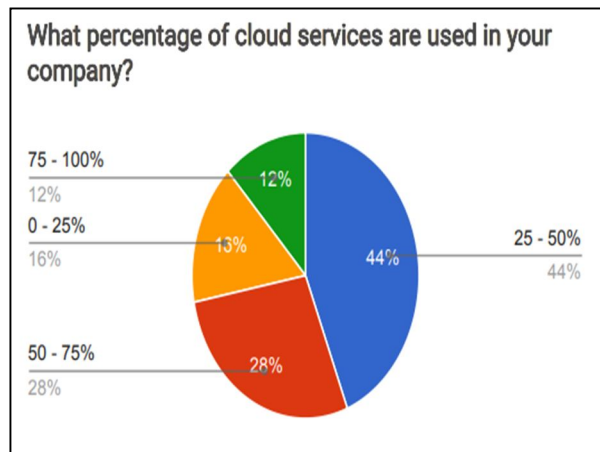


Chart 6: Summary Response for Percentage of Cloud Service used

Percentage of usage in a company for a cloud is described over here in the above image where 25-50% counts for 44%, 50-75% for 28%, 75-100 for another 12% and lastly 0-25% which comes down to 13%, as per the Chart 6.

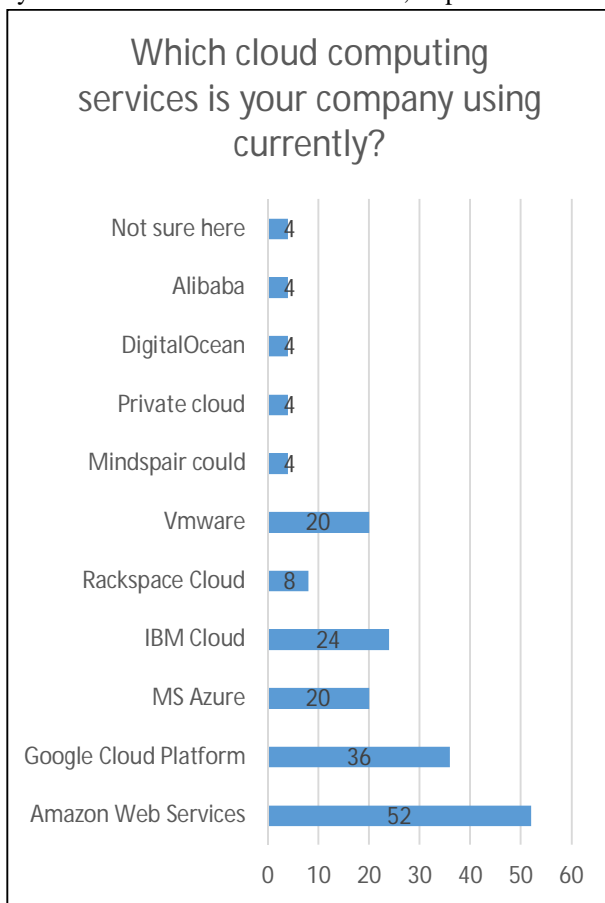


Chart 7: Summary Response for Cloud Computing Services used

There are number of companies who use cloud services which have their own list of companies who provide them cloud services there are AWS 52%, GCP 36%, MS Azure 20%, IBM cloud 24%, Rasckspace 8%, VMware 20%, Mindspair cloud 4%, Private cloud 4%, Digital ocean 4%, Alibaba 4%, as per the responses on Chart 7.

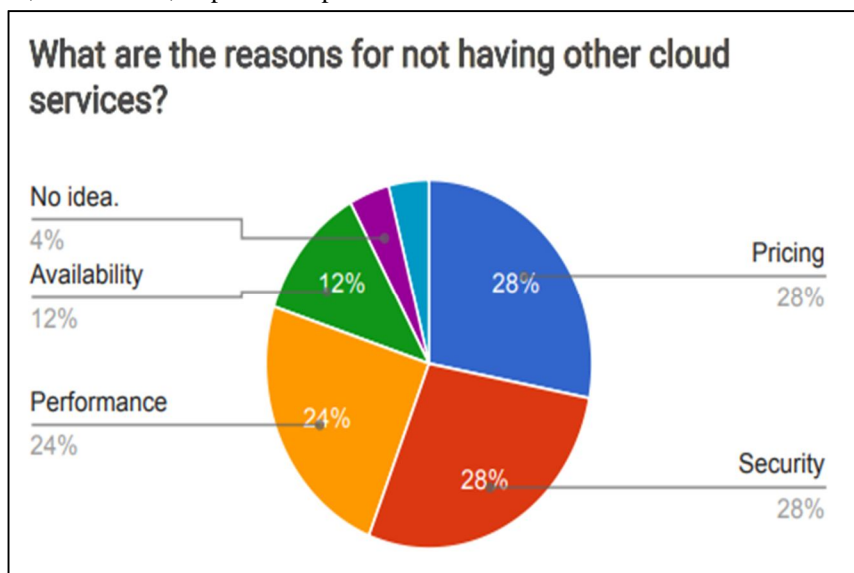


Chart 8: Summary Response for Reasons for not using the other available Cloud Services



Where many companies are trying to go for cloud services knowing their benefits there are few companies who have few reasons for not have cloud services and those are pricing 28%, Security for another 28%, availability for 12%, performance for 24% and lastly 4% actually have no idea about what cloud is what is its benefits and how it can be really used, as per Chart 8.

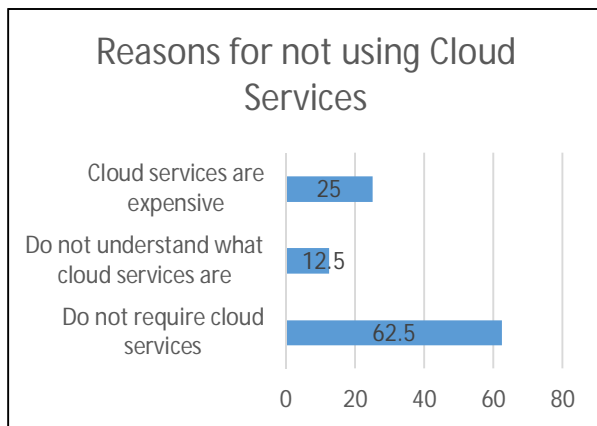


Chart 9: Summary Response for Reasons for not using Cloud Service

Few other reason for not having cloud services are mentioned in above Chart 9, whereas before cloud pricing is bit on expensive side that counts for 25%, around 62.5% in our survey do not have requirement for cloud services for their company, again 12.5% do not understand cloud services how to manage them.

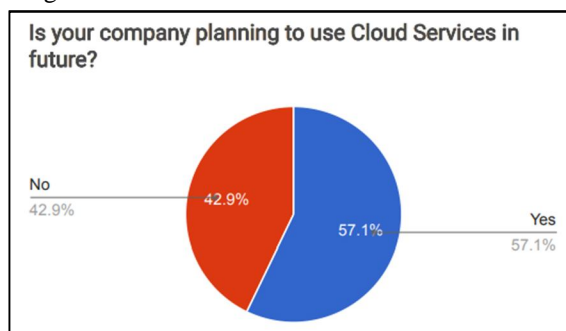


Chart 10: Summary Response for Use of cloud service in near future

Future of cloud computing in various companies are calculated in above Chart 10 where 57.1% say Yes for adoption of cloud services where 42.9% still say No to cloud services.

In above survey we have tried to accumulate the percentage of cloud computing technology is the BFSI industry is trying to use. This survey was taken place for a month where we trying to take data from all financial sectors across all domains. [6] The result status that the cloud computing technology is on the rise and the percentage varies across the sector from 0 – 100% depending on the need of the customer but there are many still many customers are still not getting hang of it due to –

- A. Price
- B. Security
- C. Availability
- D. Performance
- E. As they require skilled people to work on it.

#### IV. CONCLUSION

Cloud computing is a very good technology to invest in from all the IT solutions for the BFSI industry. It is economical, flexible and secure to a large extend. Cloud computing is majorly criticized for its security which depends on what type of cloud customer is opting for. Overall security is being managed by the big cloud companies and have many different models. It's very important to have a very skilled person who knows the cloud in and out. So that the cloud management can be taken care to benefit the customer in a long term.

### V. RECOMMENDATION

To look for different cloud service provider and its services with its pricing. Comparing the services and opting for the best package which will suit customers.

BSFI industry can slowly upgrade its IT solutions from physical Infrastructure to cloud computing phase by phase, it will definitely benefit in long term.



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