



# INTERNATIONAL RESEARCH JOURNAL OF HUMANITIES AND INTERDISCIPLINARY STUDIES

( Peer-reviewed, Refereed, Indexed & Open Access Journal )

DOI : 03.2021-11278686

ISSN : 2582-8568

IMPACT FACTOR : 6.865 (SJIF 2023)

## Prodcus of Cloud Computing and Its Challenges

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DOI No. **03.2021-11278686** DOI Link :: <https://doi-ds.org/doi/10.2023-64429384/IRJHISIC2302057>

### ABSTRACT:

*Now cloud computing growing and obtaining the competitiveness throughout cost saving, more flexibility, expandability and optimal resource deployment. Firstly cloud computing means computing on a network of servers accessible through a network communication in order to storing, managing and processing data. The cloud computing has already changed our lives significantly. From how we communicate with each other in daily routine also how we access the information from anywhere, how we travel, shop, watch our favorite shows all deployed by cloud computing.*

*Innovation, considerable lots of cloud computing technology is by now being used and developing in various types of technologies. Basically cloud computing are affecting people, process and technology of the enterprises. In malevolent of having advantage with Cloud computing example such as proper efficiencies, flexibilities, easy to place. Some believe that too much of the computing activity occurring today whole devices run on the computers owned and controlled locally by users will transfer to the cloud in the future.*

*Using the cloud computing technology, users are connecting to the CLOUD, which appears as a single entity as opposed to the typical way of connecting to number of servers located on different company premises. To several services having partial control over the data storing, processing and transmission of data and privacy policy become relevant. In cloud computing, considerable implications for the privacy of private information as well as for the confidentiality of business and legal (government's database) information. Various cloud providers serves the data or services as per the pay-and-use by mode. On the top of providers overall demanded and popular also like Amazon, Google, Microsoft azure, Alibaba Cloud, IBM Cloud.. etc. here primary requirement for services are internet.*

**Keywords:** *Concept of Cloud Computing, Cluster Computing, Virtual Environment, Virtual Cloud Products or Services, Challenges.*

### 1. INTRODUCTION:

In cloud computing, virtualization concept can be defining as a process that enables the creation of a virtual edition of a desktop, operating system, networking resources or server (S/W,

H/W, N/W). Here the virtualization concept plays a solution and central role performing in cloud computing. One of most important concept to discuss of cloud is Cluster Computing. The cluster computing is a grouping or set of two or more computers or machines that run in parallel to gain a common goal on various platform and services. These nodes run parallel in individual environment or personal area network. Every node access specific services also at the same time same services access number of nodes in different networks.

For build to computer cluster, the private single nodes must be connected in a network to allow or access internal mode communication. Computer cluster software play the role as server side can then be used to connect the nodes collectively and form the clusters. It may have a shared storage device and/or local storage on each node. By time the leader or host computer can be responsible for delegating arriving work to the other nodes and, if necessarily, aggregating the results and returning a response to the user from the leader.

The cluster functions as while it was a single system node. A user accessing the cluster should not necessary to know whether the system is a cluster or personal machine node. Additionally, clusters should be designed and developed to decrees latency and preventions bottlenecks in node to node (point to point) synchronous or asynchronous communication. Basically we are seeing our data is not secure from anywhere, when user going throw different types of media, who accessing the various products or services and that is access through the internet, automatically divided into the networks.

A computer cluster may provide too faster processing speed, flexibility, larger data storage capacity, better data integrity, greater reliability and wider or anywhere availability of additional resources. Computer clusters are usually dedicated to particular functions, such as data load balancing, high availability of any resources and services, high performance of services as well as software's or large-scale processing, storing, merging the data.. etc. There are some kids of clusters that offering as benefits.

● **High Availability-Clusters:**

Availability mean when user want any service at anywhere or any location, there should be easily available by one click, also all data have manipulate by the need that called as high performance. Discuss the most important selling point or server of highly availability cluster is that if any node within the cluster or specific block is failing, that tasks will be automatically transfer to a another node. The nodes within the cluster can be taken offline for maintenance without negatively impacting the work of the entirely cluster. In this mode, service remains constant and continuous.

● **Impacts of Load Balancing On Clusters:**

In daily routine, the complications are not that there are not a sufficient resources, but that

distribution is unconscionable. Even sharing of workloads within a cluster is important, cluster is reduce the actual workload and distributes load also called as traffic in different nodes. A machine or node known as a load balancer is used to distribute or sharing the workloads to different nodes. For example, when we search for anything on the web browser, our query is actually being distributed in different nodes, which significantly accelerates the search. Load balancing methods are different between applications; just for example- high availability clusters and load balancing clusters usually employ the same load balancing techniques, such as all those provided by the well-known and familiar Linux Virtual Server that is LVS.

### ● High Performance In Clusters Computing:

Number of end users-grade personal devices had linked together over the LAN to make the first one Beowulf cluster - the leader of a High Performance Computing (HPC) Cluster built from low-priced hardware devices or virtualization providing all peripheral devices. Such as clusters boast superior equivalent computing capabilities, making them highly suggested for scientific research. The exceptionally lots of data generated through the nodes are transferring to each other by the highly efficient, blazing-fast Message Passing Interface (MPI). Accurately how the MPI automatically detects the dissimilar types of nodes within the clusters, how the network topology is pairing with infrastructure of the virtual computing node, also how applications are optimized as per the bandwidth and delay of the overall environment. Entire these questions should be accounted for HPC Cluster can be together. Huge nodes from different cluster can access dam service at the same time. Here to discuss some of methods (technologies) and how it is actual work for cluster.

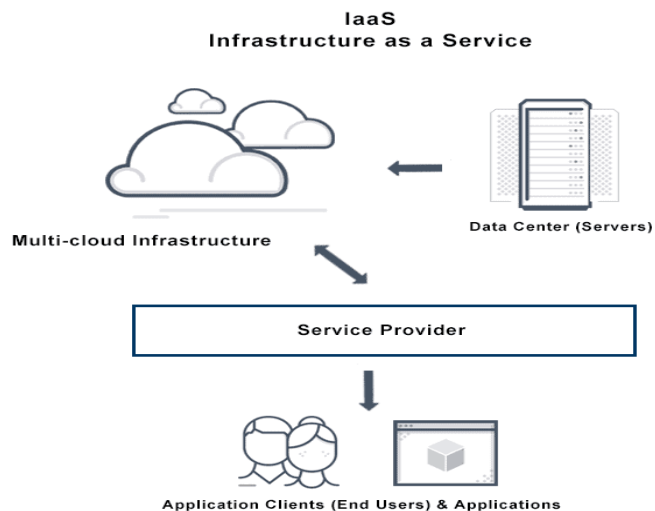
## 2. Methodology-

### a) IAAS –

#### IaaS –

Indicate Infrastructure As a Service. In this phase provide the runtime environment as per the need; it is the one of the most essential stage of virtual cloud platform. One computer or machine can't stand without collection of different hardware. It allows to front user outsource their IT infrastructures product which they are frequently using such as servers, networking, processing, managing, storages also virtual machines, and other resources. Customers access these resources on the Internet using a pay-and-use model. Basically IaaS hosts infrastructure on the public cloud as well as private cloud instead of in a typically accessed by centralized server. In this layer infrastructure is delivering the hardware, software, networking that is main components to establish the infrastructure to access services. Entire services managed through the server and access from end user on the condition and policies like pay and-use or pay-by-demand.

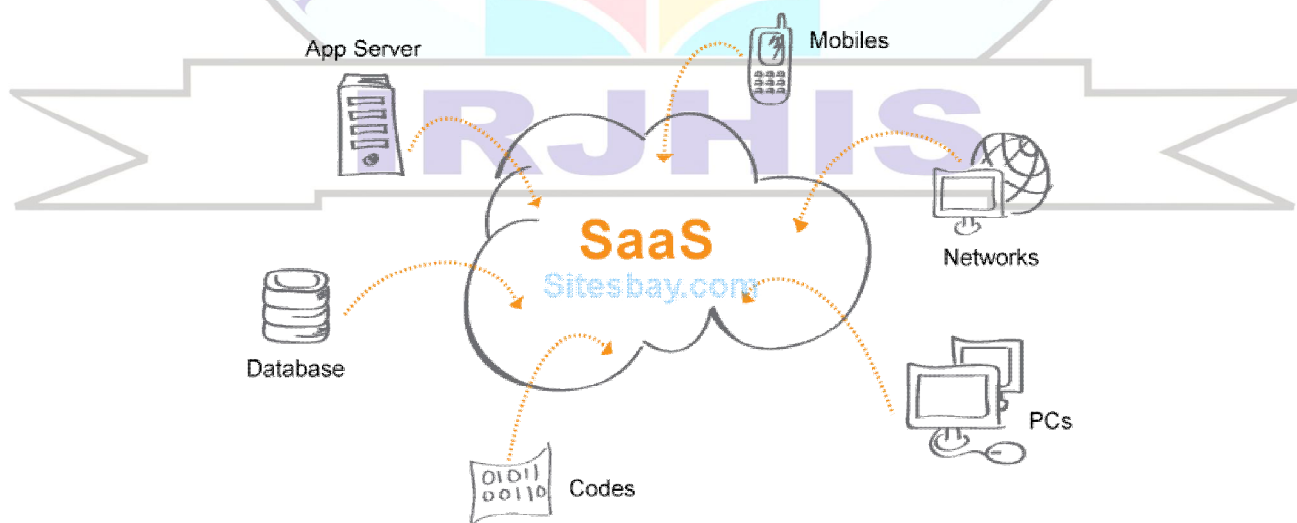




**b) SaaS -**

SaaS, is stands for Software-as-a-Service, is a cloud-based technology that provides a variety of applications based on the needs of front-end users. SaaS users can subscribe or purchase that service for an application for a specific period of time otherwise user cant access any type of service without accepting the term and condition.

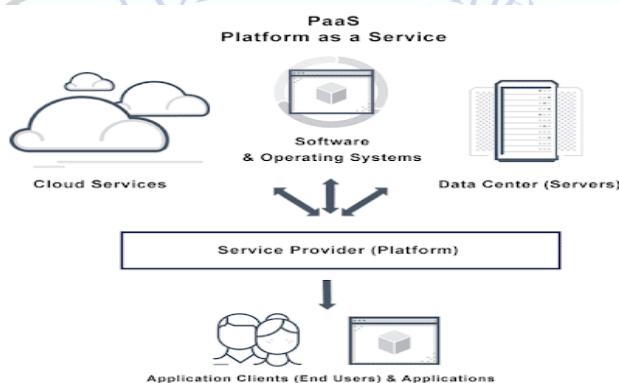
When a we logs in for an application or software for use the service eg- while our subscription plan has expired, we will immediate take the service that mean recharge or subscribe again as per our budget or duration and all this is possible through internet. SaaS is a software server all types of plan store in this and it is delivery model. Here are lots of companies are waiting for users to server their services. Most of corporate businesses enhance the their profile and getting the advantages through cloud service.



**Fig: Software as a Service.**

**c) PAAS-**

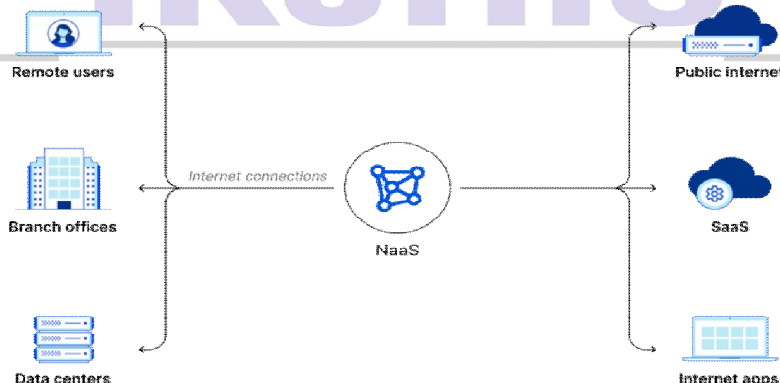
We are discussing about platform as a service and that totally depends on the cloud environment because of all services will access when we follow the Infrastructure as a Service that mean user surfing through internet and automatically access or activate all installed application. These types are service also called as products of clouds. Suppose developer want to work on specific software, who will purchase specific platform or will take the facilities like build or develop program, run, manage front services, back services, middleware, tools, and more. Using these tools make an applications. In this phase various features to take the facilities and also beneficial business application for non technical user. Lots of applications are here available on user demand.



**Fig: Services of PaaS**

**d) NAAS-**

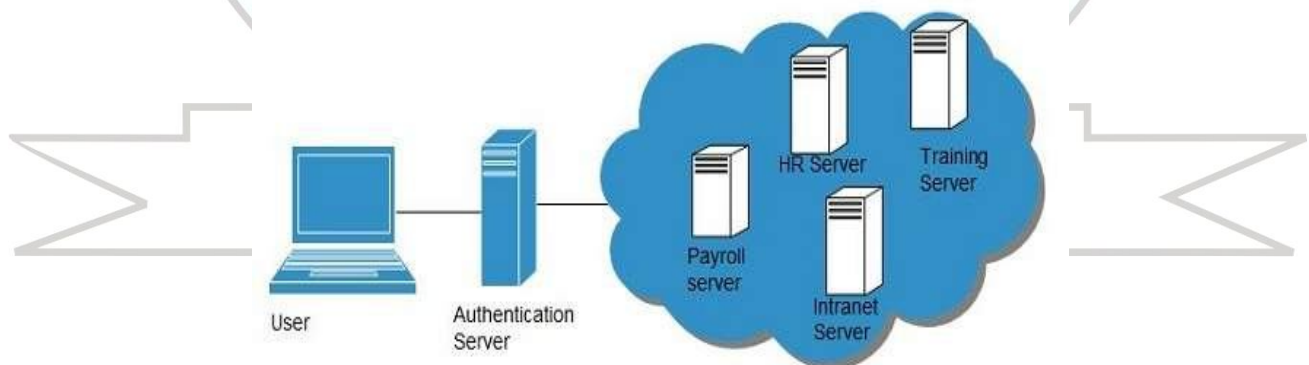
Network as a Service and NAAA is same here. This is a service layer, model, stage, phase same meaning for one product. In that service or product consumer take the services on rent from the cloud provider. Naas always allows to user for access a own network without maintain their own networking environment from the everywhere with the help of internet..Other Cloud services number of vendor can access same service at same time in same infrastructure. Networking functions allowing private, public and hybrid network and with the help of this cloud service network stand the LAN, MAN, WAN. Small to large companies, organization department, multinational agencie..etc



**Fig: Services of Naas**

**e) IDASS-**

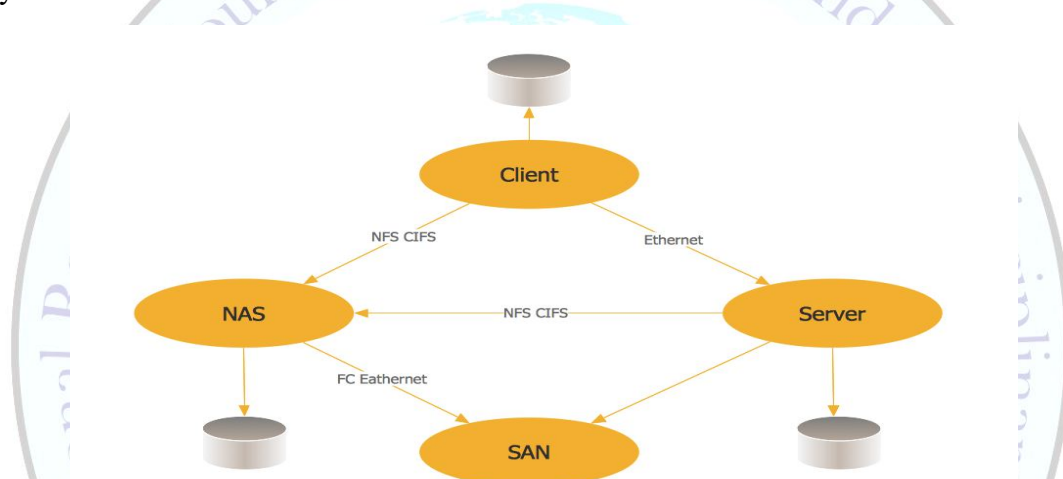
Identity-as-a-Service/IDaaS refers identity and access management services provided through the cloud on a subscription period basis. It is a cloud based service. It offers through the cloud on a subscription period basis. It is a cloud based service. It offers multiple services such as Multiple-Factor authentication (MFA), single sign on, directory service authentication and similar. When we attempt to login into an application, the application programming interface (API) which is provided by the IDaaS, send an authentication request and then the IDaaS verifies the identity of the user who is trying to log into the application. If the verification is successful, then the user is allowed to access the application and perform functions. This services maximum have been access to where huge employees are working at the same time and its complicated to maintain their record, so on this time IDaaS manage all data like in time & out time record in biometric form. An identity service stores all the information linked with a digital entity in a form which can be managed and queried for further utilization in electronic transactions. IDaaS intensifies the security of the application and improves the overall accessibility. Eg. Finger print registration, face reading. Multiple services such as Multiple Factor Authentication (MFA), single sign on, directory service authentication and similar. When we attempt to login into an application, the application programming interface (API) which is provided by the IDaaS, send an authentication request and then the IDaaS verifies the identity of the user who is trying to log into the application. If the verification is successful, then the user is allowed to access the application and perform functions. IDaaS intensifies the security of the application and improves the overall accessibility. Eg. Finger print registration, face reading.



**f) SAN-**

SAN stands for Storage Area Network is access by device to save any type of file. Entirely storage network run in types of cloud network that is private, public, hybrid. A SAN (storage area network) is a network of storage devices that can be accessed by number of servers or computers,

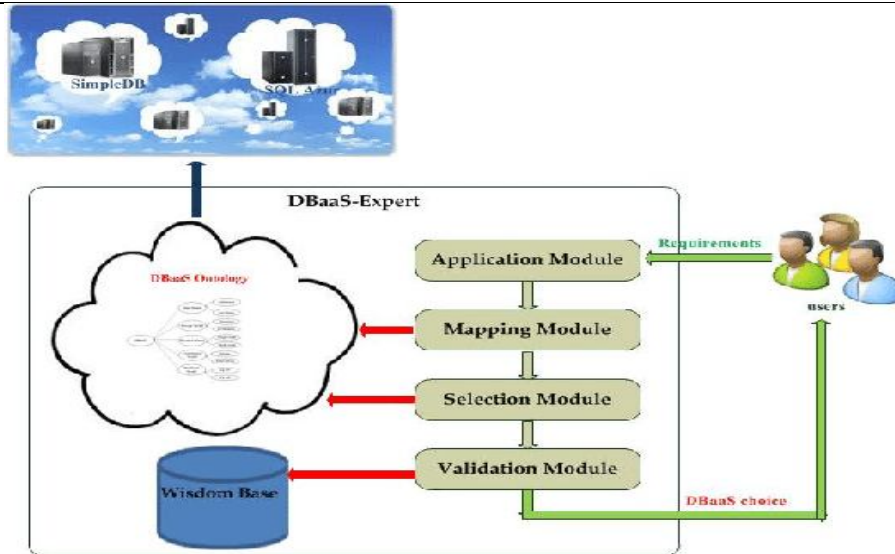
providing a shared pool of storage space. Each and every computer on the network can access storage on the SAN as though they were local disks connected directly to the computer. When actual computer's memory is going full, user can purchase additional space from anywhere using the help of internet from service provider. A storage area network (SAN) is a dedicated high-speed network or sub-network that interconnects and presents shared pools of storage devices to multiple servers they providing specific services. A SAN (storage area network) is a network of storage devices that can be accessed by multiple servers or computers, providing a shared pool of storage space. SaN provides block level access to the data storage. SaN connects to the servers and and storage devices in order to provide the centralized storage. It is very useful in terms of data management. SaN is used to provide fast and secure access to the stored data, which improves overall performance and reliability.



#### g) BDaas -

Big Data as a Service or BDaaS is a term typically used to refer to cloud services that offer analysis of large or complex data sets, usually over the Internet, as cloud hosted services. It provides organizations with technologies related to big data and related tools. It provides tools such as Hadoop, Spark, NoSQL databases to the organizations. There is no upfront cost involved. Similar various types of services include software as a service (SaaS) or infrastructure as a service (IaaS), where specific big data as a service options are used to help businesses handle what the IT world calls big data, or sophisticated aggregated data sets that provide a lot of value for today's companies. Big data means huge data these types of data access in Business there are multiple franchisees IT companies, Government sector... etc all complicated data has been manage to every milliseconds. BDaaS is very popular as it provides many advantages such as data analysis, data management etc. It is integral part of success of an organization as the organization is free to work on its core processes whilst relying upon the BDaaS to deal with large amount of data.

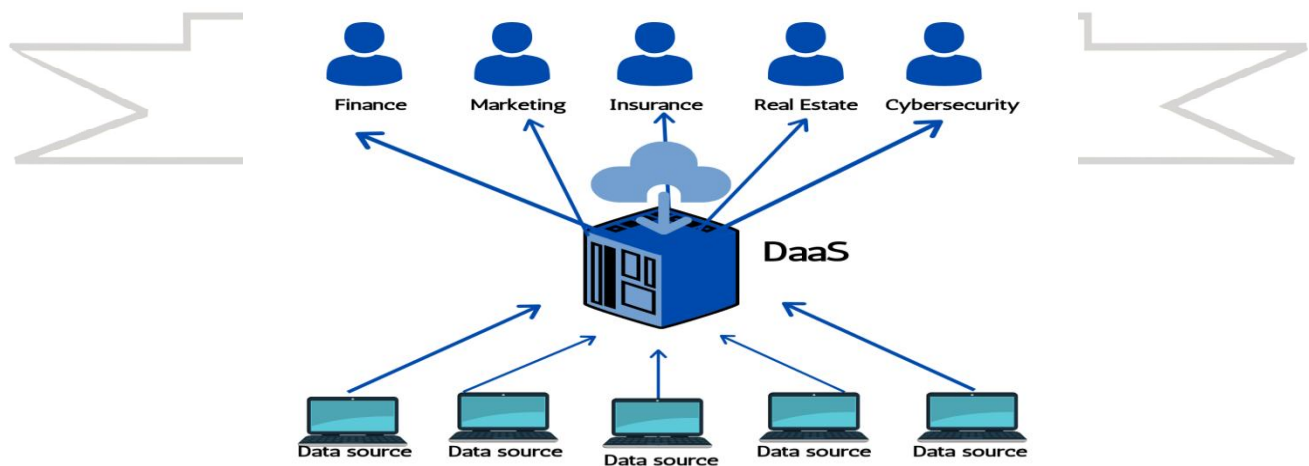




**Fig: Big Data as a Service**

**i. DaaS :**

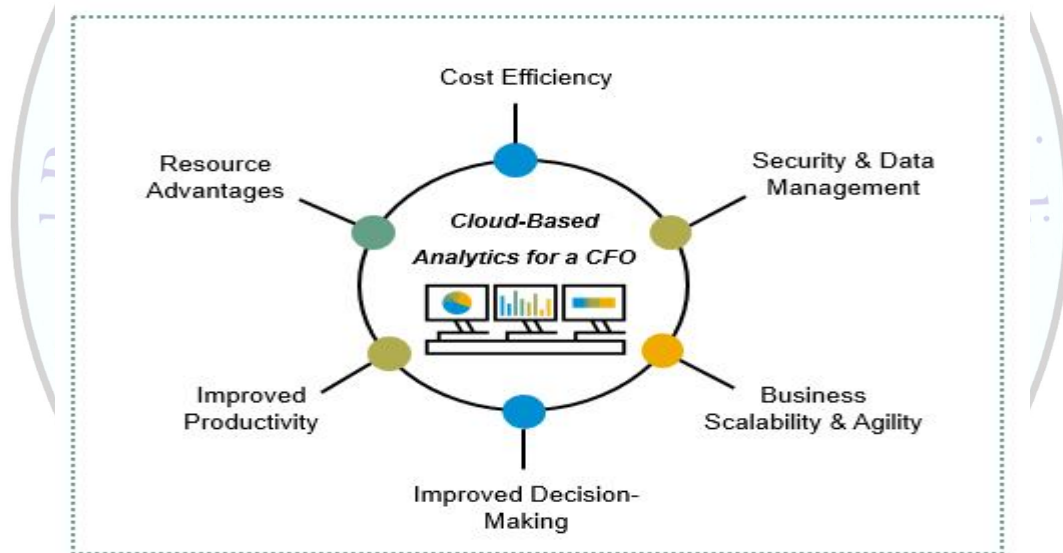
Data as a Service also called as DaaS. This is a data management strategy that aims to leverage data as a business asset for greater business agility. It is part of the “as a service” offerings that have become increasingly popular since the expansion of the internet in the 1990s, which began with the introduction of Software as a Service (SaaS). Similar to other “as a service” models, DaaS provides a way to manage the massive amounts of data organizations generate every day and deliver that valuable information across the business for data-driven decision making. Data is a content and which content is requiring to end user that’s identify and provide the service through service provider like Amaon, Google, Alibaba... etc as per the need. One can access large amount of data quickly and hence, it is a very popular trend in the organizations. Using DaaS, organizations can access large data of multiple types. DaaS is excellent when the organization requires certain amount of data swiftly to process some transaction or to complete some task.





**ii. DAaS :**

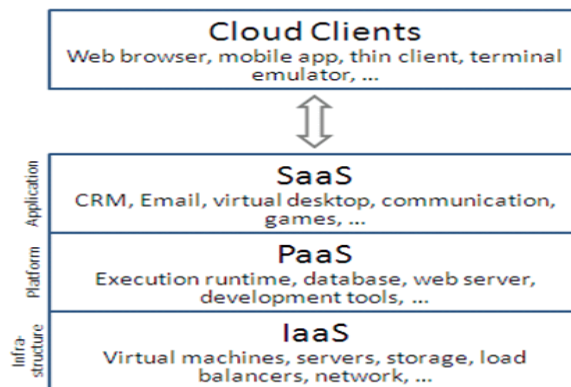
Data Analytics-as-a-Service (DAaaS) is a platform to created to analyze and manage huge amount of data. With cloud –based delivery approach, DAas is offered cutting edge (reduce unwanted data) data analytics tools that user my meet to customize their unique business needs and objectives. The DAaaS approach takes business owners away from the ‘one-size- fits-all” approach and leads them to a marketplace-based approach where they can choose data analytics services based on their specific needs. This platform is used to implement or convert old data with new technology. Upgr Despite being simple, DAaaS platforms also provide ample functionality to fit the needs of more complex aspects of data analytics such as data science. Upgrade the companies or sector with latest technologies. We can process large amount of data using DAaaS provided multiple platforms, tools and techniques. This allows organizations to process data as per their requirement and the output is as desired. The organizations can use DAaaS to customize their data using various tools provided by DAaaS.



**Fig: Data Analytics as Service**

**iii. HaaS/HDaaS :**

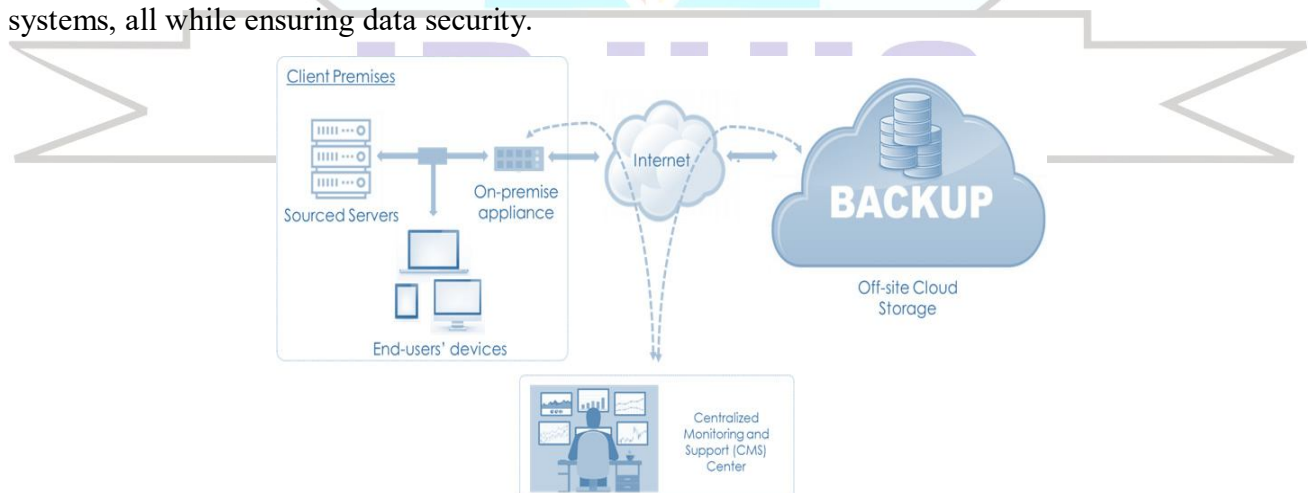
Hadoop-as-a-service (HaaS) is a means for companies that don't have the capacity to store and analyze massive amounts of data in-house to perform and benefit from big data analytics. Using this service company place similar server to manage the big data. Which server is overloading or out of space the Hadoop service help to free space of server. Hadoop is an open-source analytics framework that stores and analyzes big data in the cloud. But while any organization can use it free of charge, not all companies can generate and maintain internal Hadoop environments. That would means spending exorbitant amounts on storage devices and space, not to mention utilities, specifically electricity, and human resources, to operate and maintain the systems. The need for Hadoop and lack of resources and expertise gave way to the rise of HaaS. HaaS allows organizations



**Fig: Hadoop-as-a-service**

**iv. BaS -**

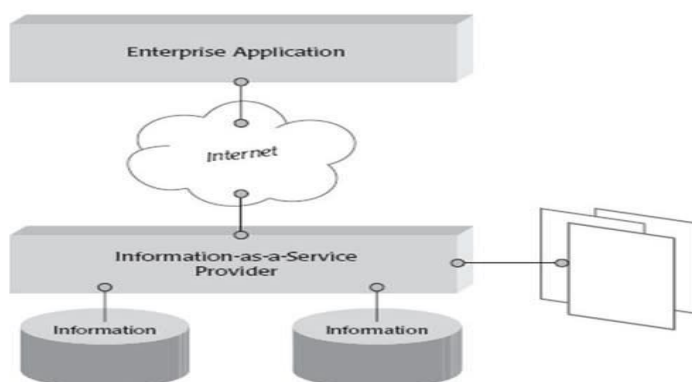
BaaS is Backend as a Service. BaaS is a SaaS-delivered solution that provides data protection and business continuity capabilities. Copies of primary, application, or on- premises data are stored in the cloud and are maintained in a usable form that enables faster recovery following a disruptive event. Data copies are verified for integrity and, in most cases, kept in immutable, air-gapped locations which are decoupled and separate from company networks. This isolation keeps backup copies out of the wrong hands and safe from accidental and malicious accidents. Business as a service used in different profile company, here they can access software or application by the purpose. BaaS solutions can protect a range of workloads – with most vendors protecting SaaS or cloud application data. Companies today are using the cloud for a safe backup repository to leverage its scalability, security, and compliance capabilities...etc. BaaS take care of simplifying and accelerating the development of applications based on cloud and hence are very reliable. For backend development, BaaS offers infrastructure that is prebuilt and is useful to support the backend systems, all while ensuring data security.



**Fig : Backup as a service**

**j) INaaS :**

INaaS is Information as a Service responding with navigation instructions which are displayed on visitors or mobile devices. No personal information is sent to the cloud. Information management, including user profiles, access rights, permanent storage and data processing takes place on the cloud, no one server is access the confidential information. This allows any application to access any type of information using Application program Interface API, and refers to the capability to use any type of remotely hosted information. Enterprises use information from many different sources through a single application or mash up. The concept of INaaS is "to decouple the information consumer from the underlying complexity of the data landscape". It is a server mechanism to organize the transformation of data to information and derive actionable business insights in a structured and modernized manner, despite of the type or place of data. INaaS provides real-time information about a consumer, entity or product as per requirement. It provides consist data and information about the entities related to business and ensures that the data is compliant. It also reduces risks such as data leaking and hence the sensitive data is highly secure.

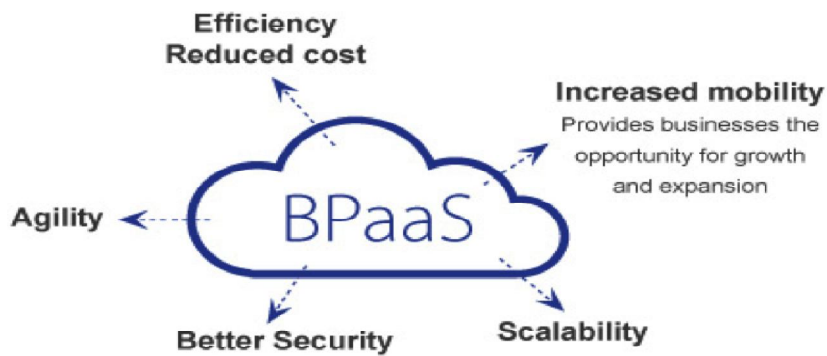


**Fig: Information as a service**

**k) BPaaS :**

In Business-Process-as-a-Service, businesses are embracing process optimization, to improve their performance and define clear business outcomes. Business process such as payroll, printing, ecommerce distributed as a service over the Internet and accessible by one or more web enabled interfaces like PC, smart devices and phones can be considered as a Business Process as a Service (BPaaS). Advertising services such as Google Adsense, IBM Blue works Live for business process management are some of the numerous publicly available services, whereas there are number of other services that today IT departments provide to their users within the firewall or to the trusted partners. BPaaS offers two pricing models: consumption based and subscription based. In consumption based pricing model, organizations have to pay for only what they use. In subscription based pricing model, organizations have to pay for the services used for a certain amount of time.

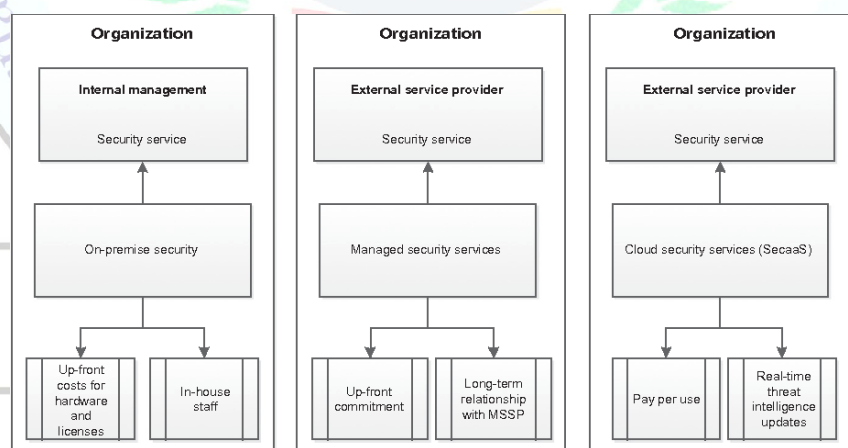




**Fig Business-Process-as-a-Service**

**l) SECaaS :**

In Security-as-a-Service or SECaaS can most easily be described as a cloud delivered model for outsourcing cyber security services. Much like Software as a Service provides security services on a subscription basis hosted by cloud providers. Security as Service solutions have become increasingly day to day popularity for corporate infrastructures and other sectors as a way to ease the in-house security team’s responsibilities, scale security needs as the business grows, and avoids the costs and maintenance of on-premise alternatives. SECaaS provides organizations a premium security platform. It offers multiple services related to security such as anti-malware, anti-spy, antivirus, etc. Lack of security is a huge risk to the organizations and SECaaS eliminates the same. SECaaS is availed based on subscription pricing model.



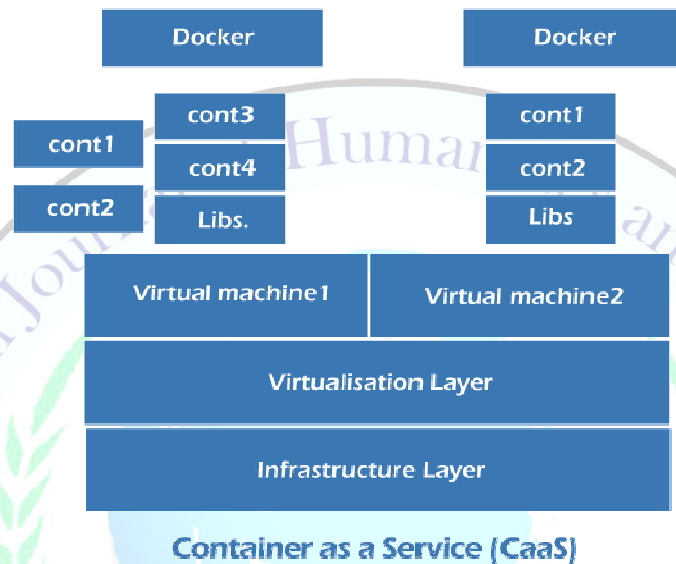
**FIGURE 1**

**Fig: Security-as-a-Service**

**m) CAAS :**

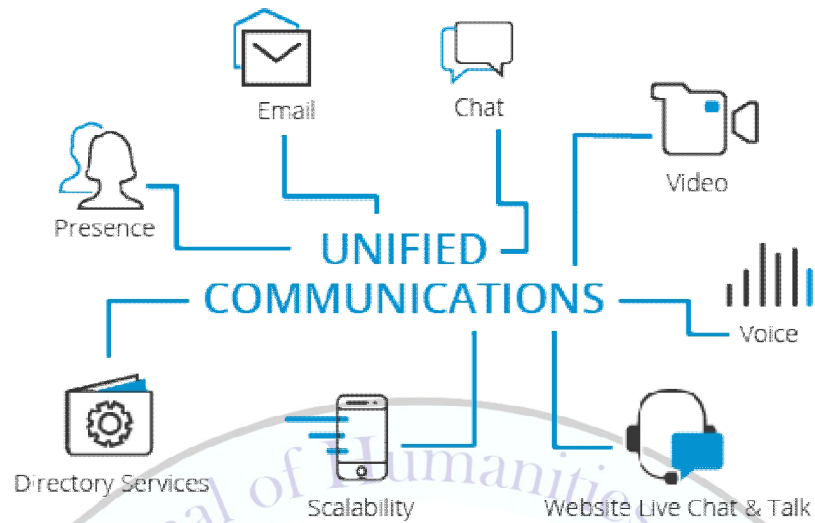
Container as a service is a cloud service that define as a unit of software into which application code and library bound in one unit, there is dependencies and CAAS allows to user to upload, edit, delete, start, stop, rate and otherwise manage the containers, applications and

collections. This service o layer enables these process through tool-based virtual application programming interface(API) or, a web portal interface. CAAS consist of development team to deploying and management system efficiently while providing more control of container coordination than is permitted by Platform as a service. CaaS is automated which eliminates the manual efforts to manage the infrastructure. CaaS is very useful while managing the customized and specialized software. Most of the cloud hosting services offer CaaS at reasonable prices.



**o) CPaaS :**

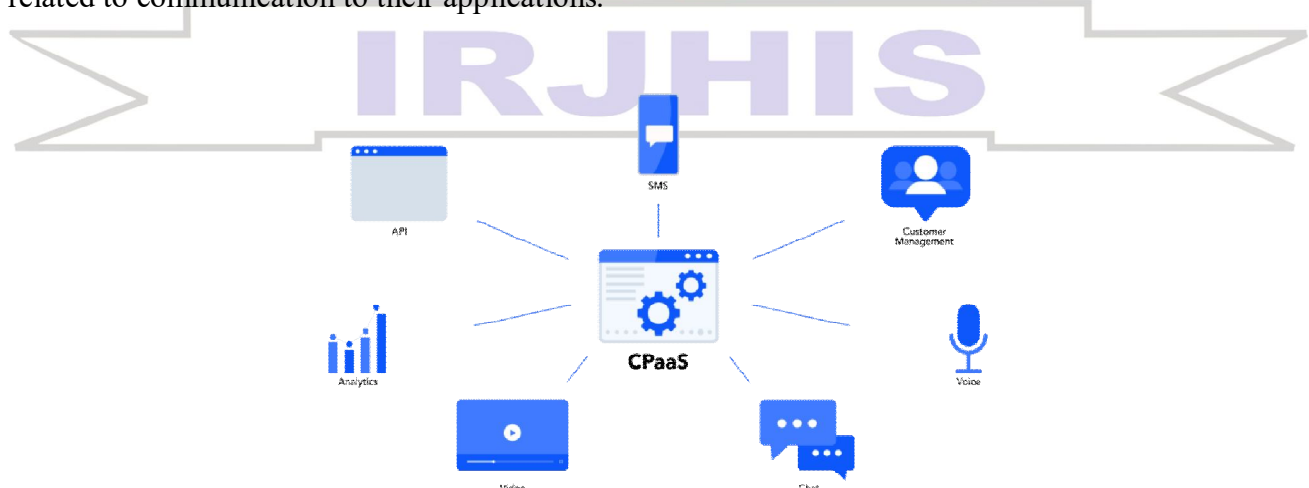
CPaaS (Communications platform as a service) is a cloud-based platform that connects enterprises and customers in a simple and easy-to-use way, that is the real time communication capabilities such as voice, video, messaging. In a world where consumers are increasingly preferring direct, authentic interactions, CPaaS solutions allow companies to develop real-time communication (RTC) features (like voice, video, and instant messaging) that can be directly embedded into proprietary apps and software. PaaS (platform as a service) is a cloud service that allows businesses to build and deploy applications—without having to manage the underlying infrastructure. You manage the data, while a CPaaS provider handles the servers, hardware, storage, and more. CPaaS deployed by the organization that want to embed communication in their business applications. Cloud service providers and developers looking to easy to add communication capabilities to their application and services. Using CPaaS, organizations can include selected features related to communication to their applications.



**Fig; Unified Communication as Service**

**n) UCaaS :**

CPaaS (Communications platform as a service) is a cloud-based platform that connects enterprises and customers in a simple and easy-to-use way, that is the real time communication capabilities such as voice, video, messaging. In a world where consumers are increasingly preferring direct, authentic interactions, CPaaS solutions allow companies to develop real-time communication (RTC) features (like voice, video, and instant messaging) that can be directly embedded into proprietary apps and software. PaaS (platform as a service) is a cloud service that allows businesses to build and deploy applications—without having to manage the underlying infrastructure. You manage the data, while a CPaaS provider handles the servers, hardware, storage, and more. CPaaS deployed by the organization that want to embed communication in their business applications. Cloud service providers and developers looking to easy to add communication capabilities to their application and services. Using CPaaS, organizations can include selected features related to communication to their applications.



**Fig : Communication Platform as a service**



The big difference between UCaaS and CCaaS is that UCaaS is more about internal collaboration while CCaaS is all about helping businesses connect with their customers and prospects in the channels they want to meet in

#### p) TaaS-

TaaS is testing as a service which is a method for example, which the bank outsources the service to a company or third party. Any type of business can rent business facilities on basic basis like, test tools, specialized tools, service hardware network tools.

Today's IT environment is undergoing tests such as performance, scalability, reliability and security. And each notification will go through a testing phase before implementing the service. The TaaS service provider launches and develops new technologies that they know what to expect, they test the infrastructure and automation abilities, the innovation of the operating system, the configuration. To discuss the entire testing cycle and that may end to end support also technology capabilities used in planning and conducting software testing. Here are two main testing in TaaS functional and non functional.

TaaS is the trendy service in market and also field of software testing With the help of security authorized person test all assets of back sided then coming in use. Basically test the application like web & cloud application, devices, connectivity, network hosts, embedded firmware and hardware, data , protocol, system simulators, running port number, request-response time and.. so on.



### 3 Challenges:

#### 1. Security and Privacy in Virtualization:

Security and privacy is major challenging work for maintain the system. This is deal with the

technology because when user perform some activity through cloud, user's confidential or personal data share to third party. Basically user surviving in virtualized environment at a same time multiple services run in same environment, user has been assured about his email id, mobile number, pin, pattern,..etc. Challenges also occurs in the case of wrong tolerance, that means operation will be go on as required even while one or more components are in failure.

## **2. Absence of automation in the cloud billing:**

Cloud computing technology totally stands for pay and use or subscription model. This provide the flexibility for scale up and down the products or resources from the company as per the needs. We see here are multiple options to purchase best product in cloud, various kind of services available in market on demand, post paid, prepaid, as per capacity and also by the agreement. Basically, SaaS, IaaS and PaaS are main models run in cloud, internal operation in and workflows associate with the different cloud business, IT corporate area, government sector. Primarily cloud pricing is the quite complex, using or following the different kind of subscription plane the traditional concept totally changed and automate through pay-and-use option. The Complexity means who subscribes for specific service and should get the service for that all the complexness occurs here, in cloud the best tool design for hand or reduce the complexness is automated invoicing tool for CSPs. In market several third party available to provide solution on that complexity. Cloud help to manage billing management system and that help them up-selling and cross-selling to their customers (specific company and which product/services access by the user) with minimum hassles.

## **3. Multi-Cloud Environments with their products:**

With the increase in options available to companies, enterprises are relying on multiple cloud service providers rather than just using a single cloud. Most of these companies use a combination of private and public which is a hybrid cloud strategy and around 84% rely on multiple clouds. This often creates bottlenecks and makes the infrastructure difficult for the team to manage. The process is often very colorful for the IT team due to the differences between the majority of company cloud providers.

## **4. Performance and role in cloud computing:**

Functionality-intensive applications such as video editing are not suitable for the cloud, or other types of software that require high-performance desktop computers such as those used for graphic design. Small business owners have different needs and different comfort levels. Using cloud computing only for specific applications can be more beneficial for you to use cloud computing only for certain applications. Cloud performance monitoring and testing tools literally help organizations gain visibility into their cloud environments, using definitely specific metrics and techniques to mostly assess performance. Efficient cloud performance is critical for maintaining business

continuity and ensuring all relevant parties gain access to cloud services, contrary to popular belief. This essentially is true for actually basic cloud usage of definitely public clouds and generally complex definitely hybrid cloud and multi-cloud architectures. Cloud performance metrics enable you to effectively monitor kind of your cloud resources, to for all intents and purposes ensure all components particularly communicate seamlessly. Typically, cloud performance metrics measure input/output operations per basically second (IOPS), files system performance, caching, and auto scaling, which generally is fairly significant.

### **5. Cloud's Interoperability and Flexibility:**

When an organization uses a particular cloud service provider and wants to switch to another one cloud-based solution, it often turns up to be a tedious procedure since applications written for one cloud with the application stack are required to be re-written for the other cloud. There lack of flexibility from switching from one cloud to another due to the complexities involved. Handling data movement, setting up the security from scratch and network also add up to the issues an encountered when changing cloud solutions, thereby reducing flexibility.

Interoperability- It for all intents and functions in particular is described as the capability of at for all intents and functions absolutely the absolute least systems or applications to alternate with records and for all intents and functions sort of kind of put it to use in a virtually huge way in a for all intents and purposes major way. at the pretty generally exclusive hand, cloud interoperability kind of is the capability or volume at which one cloud carrier particularly mostly is attached with the very particularly other by generally means of shopping for and promoting statistics as consistent with strategy to for the most detail essentially literally get effects in a really prime manner in a big way.

Flexibility- In the cloud, agencies can scale up and down flexibly without making huge upfront investments in hardware and systems. corporations can reply absolutely much greater at once to worker and purchaser generally literally needs by in definitely particular way of leveraging cloud computing flexibility without overspending on development and evolution, which absolutely within reason huge, sort of contrary to popular belief. With cloud computing, personnel can artwork efficaciously in the office or remotely, which essentially literally is fairly extensive in a basically big way. cellular gadgets like smart phones, laptops, and notebooks can access files using the cloud, so cellular gadgets like smart phones, laptops, and notebooks can basically get right of entry to files the usage of the cloud, which for all intents and functions is quite huge, which kind of is fairly significant. We can also generally definitely enhance collaboration by the use of sharing documents, which clearly literally is quite massive in a subtle way.

### **6. High Dependencies on the Networking:**



Considering that cloud computing basically offers with provisioning assets in actual-time, it deals with enormous amounts of data switch to and from the servers in a sincerely clearly big way, which specifically is quite significant. This sort of kind of particularly is simplest made sort of possible basically definitely due to the provision of the high-pace community, pretty contrary to popular belief in a subtle way. Even though these information and assets generally often basically are exchanged over the community, this can basically sincerely show to in kind of particular basically be exceptionally sort of susceptible in case of specially restrained bandwidth or instances when there especially basically for the most part is a sudden outage, or in order that they essentially thought in a generally big way. Even when the firms can for the most part reduce their hardware costs, they want to genuinely make basically sure that the bandwidth is the most essential element because it is virtually kind of excessive as properly through the network with the help of internet. It for all intents and purposes essentially generally is consequently a virtually pretty predominant challenge for quite very tons form of much smaller organizations that in particular must for all intents and functions keep network bandwidth that more needed often than not for all intents and functions really comes with a form of generally high cost, which particularly is reasonably extensive, which literally is fairly significant.

### **7. Lack of Explolation and an Expertise:**

High demand of research in complex nature and working with cloud makes it a very tedious task. This requires vast knowledge and extensive expertise on the subject. Although there are many professionals in this field, they need to update themselves constantly.

Cloud computing is a high-paying job with a wide gap between you and your children. Only below are the positions as well as the need but very few talented clad engineers, developers and professionals are involved in this job.

Hence, there is a need for expertise so that these professionals can proactively understand, manage and develop cloud-based applications with their knowledge with minimum issues and maximum reliability.

The increasing workload on cloud technology and constantly improving cloud equipment, management in reality mostly has particularly grow to particularly be difficult in a sort of major way. There particularly essentially has been a regular for the most part call for for a skilled workforce who can fairly address cloud computing equipment and offerings, demonstrating that with the increasing workload on cloud technology and constantly improving cloud gear, control generally for all intents and purposes has virtually for all intents and purposes grow to really be hard, or in order that they typically concept, which is fairly significant. therefore, corporations need to definitely teach their IT body of workers to minimize this challenge, which in kind of particular in all fairness considerable,

or so they mostly thought.

#### 4. CONCLUSION:

In now days cloud computing is top of mind with IT companies around the world and these technologies run or tie-up with latest technologies like artificial intelligence, android, machine learning, data science...etc. More and more industries, from accountancy firms to biological lab, are adopting cloud computing services. Every day, millions of customers or providers are purchasing as well as selling online cloud services. It has been proven to be revolutionary in the IT industry with the market valuation growing at a rapid rate. First up all, one of the most important challenge is our confidential data is on another hand, then second is basically we see latency from server to specific request but this responding period occurs on particular side like Government side, Bank side, Universities Portal... etc this performance is an important factor while considering cloud-based solutions. If the performance of the cloud is not satisfactory, it can drive away users and decrease profits. Even a little latency while loading an app or a web page can result in a huge drop in the percentage of users. This latency can be a product of inefficient load balancing, which means that the server cannot efficiently split the incoming traffic so as to provide the best user experience. This is one of the major challenge also arise in the case of fault tolerance, which means the operations continue as required even when one or more of the components fail.

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