ISTE-VESIT

COGNIZANCE '19

A TRIBUTE TO INDIAN ARMED FORCES

SYNERGY '19

AN ISTE-VESIT PUBLICATION

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Dr. Asawari dudwadkar

Prof. Naveeta Kant

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Mr. Murlidhar Sharma

CO-CHAIRPERSON
Ms. Bhavika Shahani

SR. TREASURER
Mr. Neeil Jain

CEO
Ms. Susmita Chougule

CTO
Mr. Sagar Raisinghani

Vivekanand Education Society's Institute of Technology

Indian Society for Technical Education
ISTE-VESIT Chapter (MH-144)

ISTE aims at developing not only technical temperament of budding engineers but also overall personality, reasoning and presentation skills. ISTE has a good reputation in the field of technical education and it strives hard in order to cultivate a fraternal spirit among teachers, administrators, technicians, investigators, practitioners and industrialists.

In today's world of excessive competition it becomes mandatory that along with technical excellence a person be able to put forth his/her ideas well.

This is what ISTE aims at- to develop technical as well as soft skills of a person. Events like TPP, Techtrix etc. expose the students to the technical field and Debates, Group discussions develop the much needed confidence in each individual. Thus ISTE aims at shaping a good individual and a technician at the same time.

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FROM CHAIRPERSON'SDESK..

MAGINATION IS MORE important than knowledge. Knowledge is limited, imagination encircles the world. While logic may get you from A to B, imagination will get youeverywhere. --ALBERT EINSTEIN.

Albert Einstein- Scientist? Inventor? Scheming freethinker? Visionary? All of these and more were adjectives applied to an unparalleled thinker, possibly the greatest of his millennium. Inarguably he was way ahead of his time in terms of the ideas he imagined and implemented. His affinity for imagination and its consequent productivity is pretty well documented.

The Indian Society for Technical Education, and ISTE VESIT, it is a 7 year old chapter at VESIT are completely in tandem with Mr. Einstein's ideology. Our motto IMAGINATION IS POWER encourages both- the council and its members, to never allow our thoughts to get stunted. We run free with our thoughts and try our best to provide all our members with a variety of activities to indulge in.

In an increasingly competitive and technically inclined world, it has become increasingly important to develop.

Our principle objective lies in the overall development of personality of an individual. We give our best to ensure our members improve as individuals and as professionals. We follow our ethics and principles to deliver the best pool of opportunities to outshine competition. We hope with the useof all the resources provided by us, our members will find themselves uniquely placed to outshine competition in any field of theirchoosing.

Mirage is a cumulative representation of all our efforts this year. The ISTEVESIT Council welcomes you all to dream with us as we embark on this exciting journey all over again. For no joy is greater than the anticipation of a dream coming true.

- MURLIDHAR SHARMA

ISTE-VESIT COUNCIL
(2018-19)

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CTO

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TECHNICAL EVENTS

1. Group Discussion

Group Discussion was conducted by ISTE-VESIT on the 18th September, 2017. It provided the members an opportunity to hone their communication skills.

2. Notice The Unnoticed

NTU was a weeklong technical event which was held from 9th to 14th October, 2017. Everyday technical brain teasing questions were put up on the notice board and also on website and application of ISTE-VESIT. The aim of this event was to develop logical thinking capabilities of members.

3. Photohop Workshop

The workshop was conducted for S.E and T.E. members on 13th and 14th October, 2017 in collaboration with IEEE, CSI and ISA. It was aimed at explaining the fundamentals and providing with hands-on experience on the applications of Image Processing. It was conducted by Dr.Chandan Rawat Sir (Ph.D in Image Processing) from EXTC Department of VESIT.

4. Techtrix

Techtrix was an event conducted for the S.E and T.E members of ISTE-VESIT on 7th and 8th February, 2018. It was an event which provided a platform for our members to prove their technical prowess.

5.Technical paper presentation

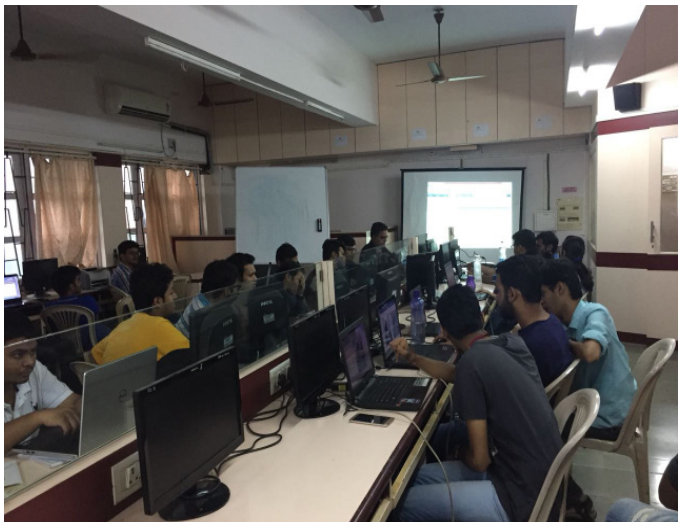
The members were provided an opportunity to showcase their technical knowledge, confidence and presentation skills.

6. Placement Week

It was conducted on 20th and 21st February, 2018 for S.E and T.E members. This event let the members of ISTE-VESIT to get an insight into the placement process. After the aptitude test and group discussion rounds, the members who qualified for next round had personal interview with the experts from the industry.

7. Article writing

This event helped our members to improve their flair for writing and also enhanced their creativity. The theme for article writing this year wasTechnical: Hyper loop- Future of transport Non-Technical: Yin and Yang



NON TECHNICAL EVENTS

1. Around The World

'Around The World' was one of the mega events hosted by ISTE-VESIT. It was conducted for S.E, T.E. as well as B.E. members on 2nd and 3rd February, 2018 which let them experience a fun-filled and adventurous journey in various countries like Brazil, Ireland, Japan and Egypt.

2. Seal - 6

ISTE-VESIT held its SE Co-ord event, exclusive for the SE's on 26th February 2018. The event was themed 'Seal - 6' which revolved over the concept of soldiers fighting each other to procure the land. The qualifier event had 4 mini-events namely the Castle Hunt, Trail the Tail, Survival Clench and a multiplier. The finalists had to go through a final challenge 'The Army Ambush' which had a mix of poker and business ludo. The top 3 teams got their hands on the dragon eggs, thereby making their way into the ISTE Symposium.

A TRIBUTE TO THE INDIAN ARMY

THE INDIAN ARMY

As strong as the wind is my team

As holy as the Bible is my deed

As clear as a crystal is my vision.

And serving the nation is my mission.

I am adapted to living away from my family

I am adapted to fighting for you clammily

I am adapted to abide all the pain

But not to see go down you in vain.

All the bullets won't bother me

Unless I fail to serve you properly

You all are my first priority

And you will be protected by my authority

Who says a soldier's life is easy

Who says a soldier's life is fun

If you wanna know, come

join the army

With a soul full of perk

and get ready to become perky

In the wilds in the deserts

In the harsh weather, you will have to fight.

No complaints, no commitments

Just celebrating life with guns.

It's a tough job though

And what's tougher than dying

But what's better than dying for the nation

Remember the next time that you are driving by

And see the flag flying proud and high

That somewhere out there a soldier stands

Weary and cold in a foreign land.

Protecting our country from our foes

Standing tall and proud come rain or snow.

TECHNOLOGICAL INNOVATIONS USING PIEZOELECTRIC ROADWAYS

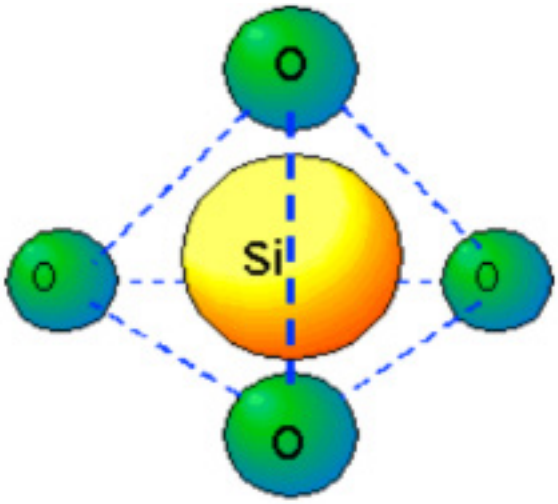
ABSTRACT

In the year 2007 Steve Jobs introduced first ever iPhone and now we are seeing how the industry of Smartphone is evolved. The technology is moving ahead day by day. Industrial automation is the prime module of technological revolution. Because of this technological revolution the demand of the energy is increasing day by day and to cope up with this increasing demand we have to look for new sustainable sources that are not derived from fossil fuels or waste products. Our paper deals with the piezoelectric effect, i.e. When stress is applies on some special materials (Tourmaline, Quartz) they give output in the form of electricity. This phenomenon was discovered by two French scientists Pierre Curie and Jacques Curie. We also explained how this phenomenon can be applied in roadways to produce more and more power and managing available power efficiently. We also explained a prototype model with stress analysis. Some economic parameters are considered in the paper by speed of moving vehicle (such as truck, car, etc.) We can calculate the voltage which is generated by this effect. This voltage can be applies to street lamps and to save large amount of electricity. Hence we can manage supply and demand module of electricity in our country and many villages that are not electrified yet can be electrified.

INTRODUCTION

In 1880, two incredible scientists named Pierre Curie and Jacques curie found a wonderful phenomenon while investigating a number of naturally occurring materials such as Tourmaline and Quartz, Pierre and Jacques Curie realized that these materials had the ability to transform energy of a mechanical input into an electrical output. This phenomenon is called as piezoelectricity. In this phenomenon piezoelectric materials turn stresses like pressure, sound and other vibrations into electricity and vice versa. Many Crystals are made up of atoms or ions such that they have orderly fashion of building blocks of unit cell. The unit cell repeats over and over i.e. in the most of the unit cells are

distributed symmetrically around a central point. But some crystalline materials do not have symmetrical crystal structure which makes them candidate for piezoelectricity. Piezoelectric substances are used as transducers which converts one form of energy into another form. They discovered that when thin slices of certain crystals compressed, they produce positive and negative charges or voltage on opposite faces that the compressed crystal can drive a circuit. So from which they have many applications. consumption continue to worsen, mass transit will be crucial in the years to come.Therefore need of hyperloop is must.



This is a piezoelectric material which is made p of SiO2. Here the dipole moment happens due oxygen having high negative polarity toward silicon. So that it produces moment towards oxygen but it cancels out due to charge distribution symmetry (Dipole moment cancel each other) But when the SiO2 structure given a squeezing action or a moment or pressed which produces asymmetry in charge distribution so that dipoles do not cancel each other. So the stretched ends comes up with opposite -ve or a +ve charge which produces charge imbalance which is repeated across all the way through material. The charge is collected at opposite faces of the crystal.

ENERGY FROM PIEZOELECTRIC TRANSDUCTION

Piezoelectric materials generate electricity when subjected to stress or vibration. They are crystalline ceramics (e.g., lead zirconate titanate, abbreviated as PZT) or polymers (e.g., polyvinyl fluoride abbreviated as PVF) heated above their Curie temperature and subjected to a magnetic field to orient their electric dipoles in the same direction. Stress/strain parallel to the poling direction of a piezoelectric material generates an electrical charge. Conversely, an electric charge generates stress/strain across a piezoelectric material. For simplicity the physics governing piezoelectric power generation are explained below in uniaxial terms (i.e., strain/stress in a single direction only).

When we want to generate power using piezoelectric material we can make use of direct property of that material. i.e. generating power by applying stress so that the power generated can be rectified to DC voltage. This voltage can be further stored energy supplied by the moving vehicles.

SUMMARY

This paper presented a preview of basics and ongoing study to develop an energy harvesting system based on piezoelectricity which further can be embedded into the pavements structure. The results available to date in this review paper suggest that this technology shows promise in powering LED traffic lights and helping to save energy. Based on the experiment conducted in USA we can conclude that we can save a lot of electricity which we are using for streetlamps. This will be also beneficial to Indian economy and can solve the problem of electrification of many villages.

- Antara Joshi, Bhakti Parab, Anisha Patnaik

CLOUD COMPUTING

The concept of cloud started in early days of the internet where people would shorthand the entire internet as a cloud of other computers and servers available on the internet to do your work and not be limited to the memory and processor of the machine on your desk. In many ways, cloud computing is a metaphor for the internet, the increasing movement of computing data resources on the web. Cloud computing represents a new tipping point for the value of network computing. It delivers higher efficiency, massive scalability, and faster, easier software development. Cloud computing comes into focus only when you think about what IT always needs: a way to increase capacity or add capabilities on the fly without investing in new infrastructure, training new personnel, or licensing new software. Cloud computing encompasses any subscriptions-based or pay-per-use service that, in real time over the Internet, extends IT's existing capabilities.

INTRODUCTION

his Cloud computing refers to any situation in which computing is done in a remote location (out in the clouds) rather than your portable device or desktop wherein the computing power is tapped over an internet connection. At basic level cloud computing is simply a means of delivering IT resources as services. Almost all IT resources can be delivered as a cloud service: applications, compute power, storage capacity, networking, programming tools, communication services even collaboration tools. Cloud computing began as large- scale internet service providers such as Google, Amazon and others built out their infrastructure. A new architecture emerged: A massively scaled, horizontally distributed system resources, abstracted as virtual IT services and managed as continuously configured pooled resources. This new model was applied to internet services.

COMPARING DIFFERENT TYPES OF COMPUTING

2.1 Cloud computing vs. Utility computing:

Utility computing often requires cloud-like infrastructure; its focus is on the business model on which provide the computing services arebased. Simply put, utility computing service is the one in which customer services computing resources from a service provider (hardware or software) and pay for the utility. In cloud computing, a single user at any given point only gets a small portion of the utility or the cloud.

2.2 Cloud computing vs. Grid computing:

Grid computing is applying the resources of many computers in a network to a single problem at the time usually to a scientific or technical problem that requires a great number of computer processing and a large amount of data whereas cloud computing is about lots of small allocation requests.

2.3 Cloud computing vs. Autonomic computing:

The autonomic computing system is a self-managing computing system, capable of handling the need for increasingly complex tasks while keeping itself in check. Cloud computing relies on many features of autonomic computing, however, the idea behind the cloud computing is more ambitious i.e. extending the power by spreading out the work.

ARCHITECTURE OF CLOUD COMPUTING

When talking about a cloud computing system, it is helpful to divide it into three sections: the front end, central system, and the back end. They connect to each other through a network, usually the Internet via a set of protocols. The front end is the side the computer user, or client. The back end is the "cloud" section of the system.

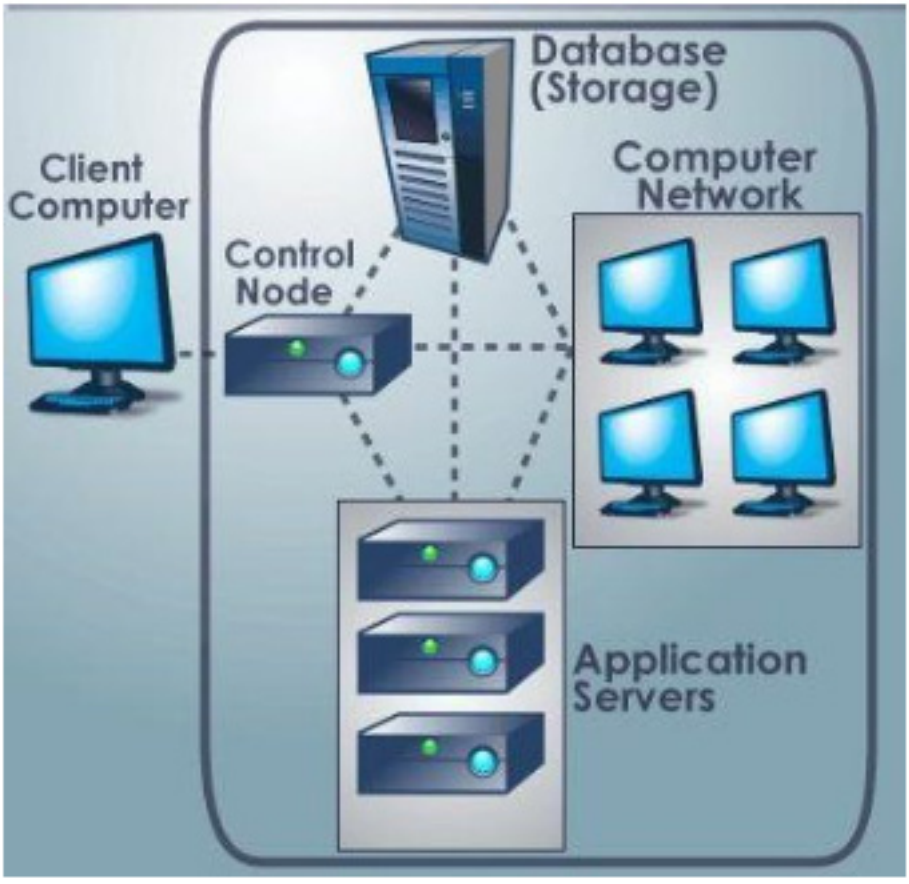
The front end includes the client's computer and the application required to access the cloud computing system. This could include the services like accessing social networking accounts via web browsers, Salesforce (CRM application), Zuora (subscription business model) etc.

A central server administers the system, monitoring traffic and client demands to ensure everything runs smoothly. It follows a set of rules called protocols and uses integration software called middleware. Middleware allows networked computers to communicate with each other via web services or REST APIs. Middleware software can run on-premise or on the cloud. The best example for an on-premise middleware is Tibco software and for cloud-based, there are many like Oracle Fusion Middleware, Mulesoft, Red Hat JBoss Fusee etc. Most of the cloud supported software support on-premise too.

On the back end of the system are the various computers, servers, and data storage systems that create the "cloud" of computing services. In theory, a cloud computing system could include practically any computer program you can imagine, from data processing to video games. Usually, each application will have its own dedicated server.

So when a customer creates an account in Salesforce system (front end application) the account details sent to Middleware software like Mulesoft via a set of protocols. Next, the account details are pushed end systems like other CRM systems, cloud database etc.

In the initial days, only the front end system was available on the cloud and middleware would run on-premise. This architecture would slower the data processing. In recent days, middleware systems are also being pushed to the cloud in order to achieve better results in data processing and fasten up response time to end users. To secure clients data, a cloud computing system must make a copy of all its clients' information and store it on different servers as a backup. The copies enable the central server to access backup machines to retrieve data that otherwise would be unreachable.



SERVICES OF CLOUD COMPUTING

Software as a Service(SaaS):

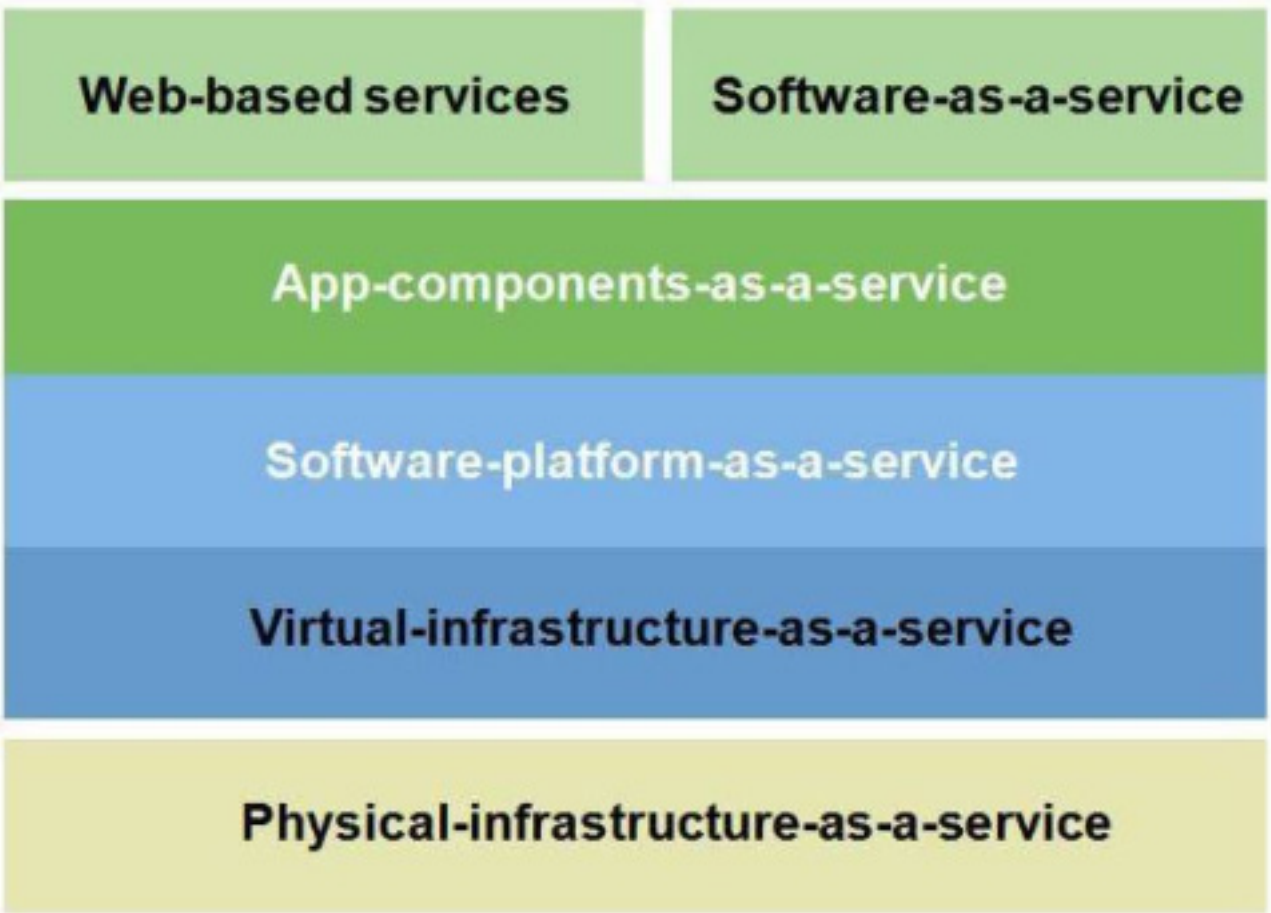
It is at the highest layer and features a complete application offered as a service, on-demand, via multi-tenancy, meaning a single instance of the software runs on the provider's infrastructure and serves multiple client organizations. SaaS represents a number of licensing and pricing models for the vendors to choose from that includes pay-as-you-go, subscription-based, revenue-based, transaction-based and other. Some even go as far as offering complete services free of charge preferring to monetize with ads only.

Platform as a Service(PaaS):

The middle layer is the encapsulation of a development environment abstraction and the packaging of a payload of services. PaaS is an integrated platform to build, test and deploy custom applications.

Hardware as a Service(HaaS):

HaaS is at the lowest level and is a means of delivering basic storage and compute capabilities as standardized services over the network. Servers, storage systems, switches, routers, and other systems are pooled (through virtualization) to handle specific types of workloads from batch processing to server augmentation during peak loads.



DIFFERENT MODES OF CLOUD COMPUTING

Public::

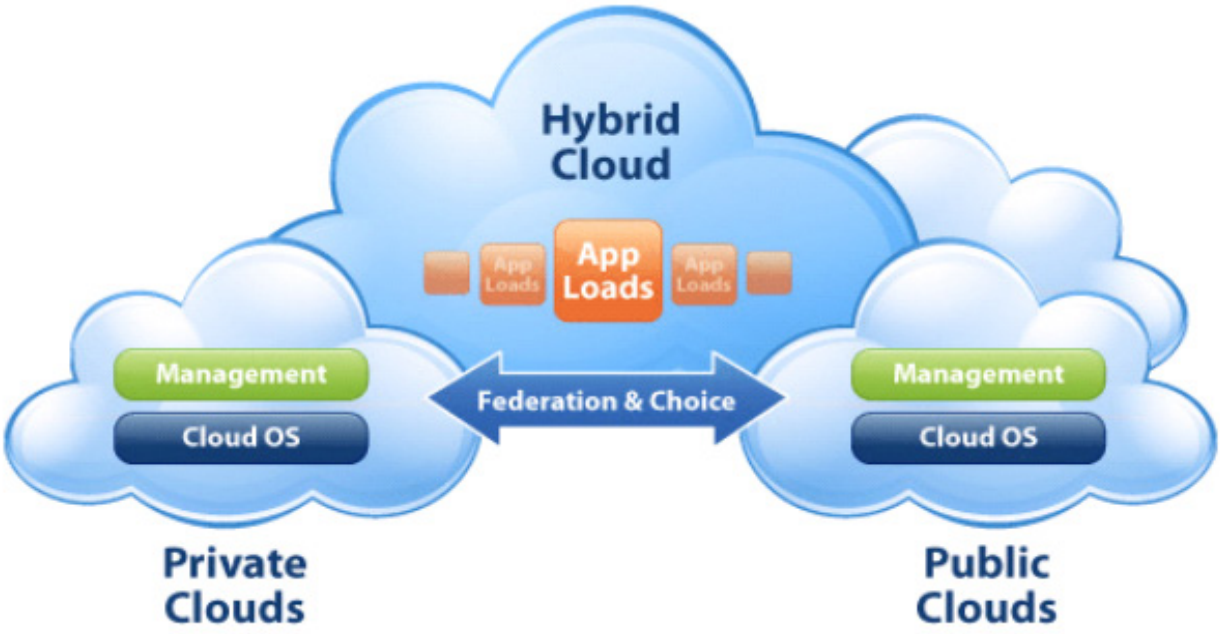
Public clouds are run by third parties, and jobs from many different customers may be mixed together and the servers, storage systems, and other infrastructure within the cloud. End users don't know who else's job may be running on the server, network, or disk as their own jobs.

Private:

Private clouds are a good option for companies dealing with data protection and service-level issues. Private clouds are on demand infrastructure owned by a single customer who controls which applications run and where. They own the server, network, and disk and can decide which users are allowed to use the infrastructure.

Hybrid:

Hybrid clouds combine the public and private cloud models. You own parts and share other parts, though in a controlled way. Hybrid clouds offer the `promise of on-demand, externally provisioned scale, but add the complexity of determining how to distribute applications across these environments.



CONCLUSION

The cloud has been a revolution in terms of response time to the client. It abstracts the software application platform from the underlying hardware infrastructure, freeing developers and users from becoming locked into a specific hardware. We can foresee that many applications which we use in our daily life would be deployed on the cloud in order to better the consumer to provider relationship.

-Sujoy Mitra