



Cloud Computing and Allied Educational Domain: Organizational and Business Development

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Abstract:-

Cloud Computing is an important name for virtualization. Cloud Computing is closely related with Networking Technology; however it is much more wider domain than that and responsible for many activities such as creating online availability and remote based services of hardware, software, application, utilities and operating system by a centralize unit; usually called Data Centre or Cloud Service provider. Cloud Computing is emerging as an important domain of Computer Science, Information Science and Technology and Electronics and so on. But still academic programmes and degrees on Cloud Computing or virtualization are very much limited around the world and even in India. Hence this paper focuses on the opportunity to introduce Cloud Computing in academic domain existing set up or some modification. This paper is also discusses about the general aspects of Cloud Computing.

Keywords:-

Cloud Computing, Green Computing, Cloud Information System, Virtualization, Academics, Degrees, Universities

Introduction:-

Cloud Computing is a technology which uses the internet and central remote server to maintain data and applications. Virtually Cloud Computing allows much more efficiency in Computing and Information Technology practice by providing centralize storage, money,

processing and bandwidth and hence organizations; whether big or small no need (or less requirement) to establish own and separate IT infrastructure and some higher business units [05, 12]. Cloud Computing is purely depends on Networking Technology (and side by side Storage Technology) more clearly internet technology. Hence it is one of the most booming technologies among the other Information Technology weapon in today's scenario. Academically India is strong and sophisticated country due to its large number of educational institute with several sector and community [09, 13].

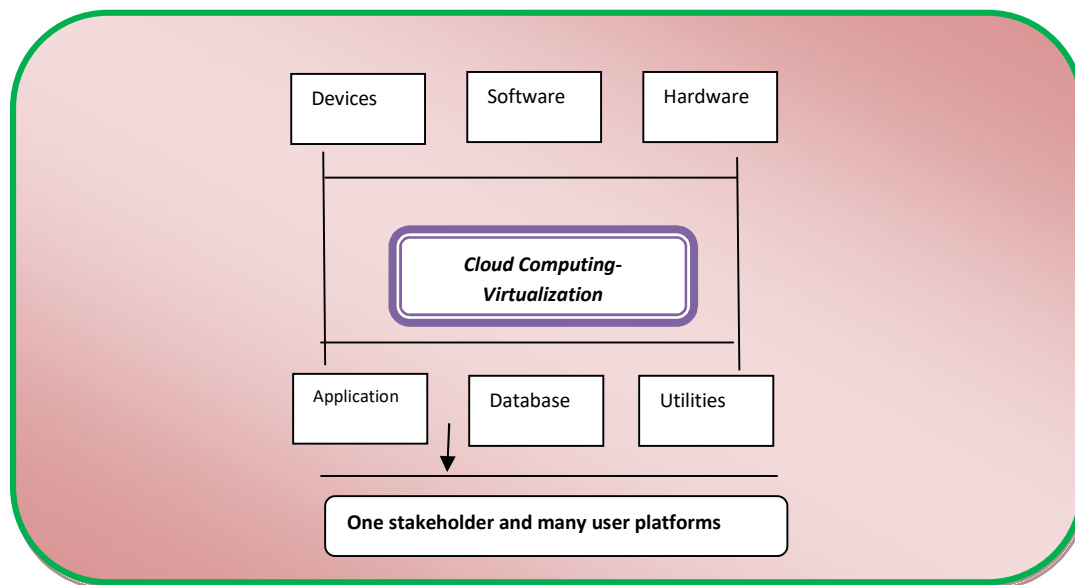


Fig: 1- Showing component of virtualization at a glance

Hypothesis and Target:-

Main aim and objective of this paper is includes but not limited to as follows—

- To know basic about Cloud Computing; its basic feature as well as characteristics in brief manner.
- To learn about the Cloud Computing and its importance and need in contemporary profit making and nonprofit market.
- To know about the several platforms and service providers of Cloud Computing and virtualization.
- To learn about the educational degrees, universities, and higher learning institutions in India.
- To know about the Cloud Computing integrated IT and Computing and related programme in Indian educational context.

Cloud Computing: Basic:-

Cloud Computing is actually a type of procedure and mechanism of spreading Information Technology infrastructure with internet and networked services. Cloud Computing offers an important and outstanding solution for all our data storage and data sharing needs [06, 09]. It is virtually dedicated to the consumption in time, money, technology, hardware and so on. Cloud computing practically makes more sophisticated centralized storage, memory, processing and bandwidth. 'Cloud Computing and virtualization' has broken down its state three main types Segment application, storage and connectivity. Today many organizations and institutions are moving towards Cloud Computing due to its ubiquitous network access, location independent resource pooling as well as elasticity [12, 18].

Computing and Allied Domain:-

Computing is an important domain of Applied Science and Technology which is mainly responsible for design, development, management and implementation of computer software, hardware and other system. The nearest and closest field of computing is, Computer Science which has also a strong theoretical and research orientation in the academic programme. Computer Science and Engineering [CSE] is dedicated to design and development of computer architecture, machine and other computing devices rather than software application and development. Computer Application is another programme available in mainly Indian Universities, Engineering, and general colleges; which is mainly dedicated to applications and utilizations of computer in many domains and fields and several sectors such as Business, healthcare, education and so on [10, 15, 18]. IT is much more broader subject and combines with some more technologies such as Networking Technologies, Communication Technologies, Multimedia Technologies, Web Technologies and responsible for Electronic Information System. Information Science [IS] and Information Science and Technology [IST] is another computing related interdisciplinary field responsible for information infrastructure building for wide range of stakeholder with main aim of Information-Technology-People interaction [21, 23].

Need of Cloud Computing and Virtualization:-

Cloud Computing is needed as an academic programme with Degree, Diploma and certificate level however it is also possible to offer as specializations of IT, Computing Science and Information Science for the fulfillment of the following aim and activities—

- In Cloud Computing and Virtualization it is very easily possible to share, information, content, integrating audio- video to the client or group of users.
- Wider and sophisticated bandwidth, processing, speed as well as data storage are possible with Cloud Computing and Virtualization.

- Technological and system wise flexibility as well as efficient in the overall Information Technology Infrastructure many ways promoted by the Cloud Computing.
- Hassle Free deployment and engagement as well as efficiency in the complete Information Technology infrastructure [22].
- Easy technological transfer and easy transfer of software and several technological systems through online media.
- Fast remote based services is possible with Cloud Computing application and thus any type of organization and institution can get hardware, operating system with out their own and thus initial investment is very minimum.
- Cloud Computing educated needed for providing a standardize scalable and much more secure physical infrastructure.
- Cloud Computing create an important atmosphere of virtual information and Electronic system and online system.
- Cloud Computing allows virtualization and thus there is no as own IT system and thus it minimizes carbon emission and releasing harmful chemical. So, sustainable development in another reason for Cloud Computing promotion.
- Cloud Computing provides a standardized, scalable and most secure physical infrastructure and Infrastructure-as-Service.
- It is applicable top speed a workload over many more server than one world be able to access in some own data centre [14, 25, 37].

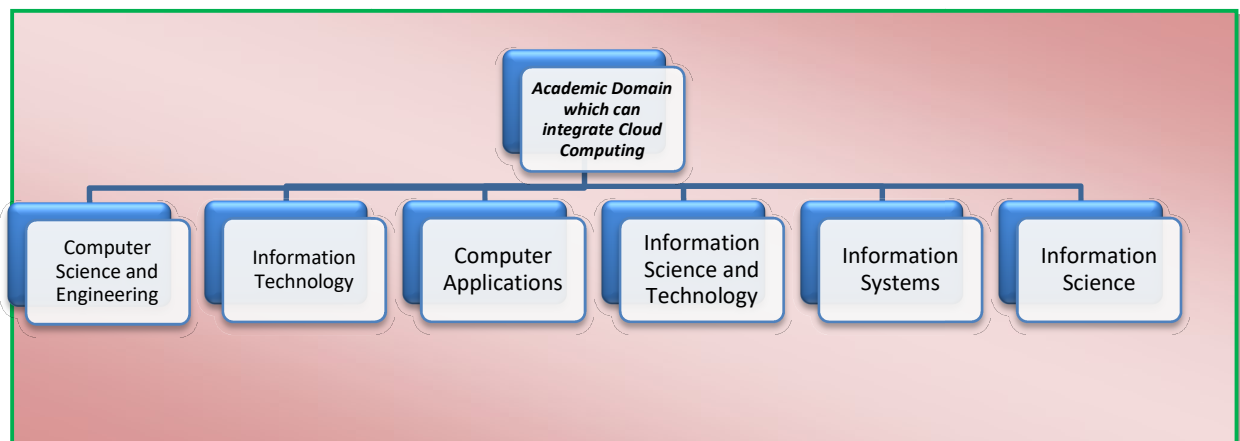


Fig: 2-Showing possible departments where Cloud Computing specialization may be offered

Possibilities in Cloud Computing in Indian Educational Context:-

With 600+ universities including Central, State, Private and deemed, 200+ central research institute, 5000+ technical and management institutes, 20000+ degree colleges and numerous other traditional and vocational institute with many subjects which are listed in Figure 2. Unlike other Western countries Science Education in India divided into two types of nomenclature one in ‘BSc and MSc’ another is ‘BTech and MTech or BE and ME’. In many subjects one can obtain all these nomenclatures like Computer Science is offered with the nomenclature of [BSc/BTech/BE] and IT and Electronic too. Hence Cloud Computing can be

integrated ort may fall under the domain of Computer Science, Information Technology, Electronic Science, Information Science and so on [18]. The Indian Institutes at a glance is provided in Fig: 3

In most of the Universities and Colleges IT and Computer Application Degree are common.

Universities/ Higher Educational Institutions	In Numbers	Location
Central Universities	44	Pan India with 28 States and UT
State Universities	304	Pan India with 28 States and UT
State Private Universities	165	Except some states and UT
Deemed Universities	130	Except some states and UT
Indian Institute of Technology [IITs]	16	Bhubaneswar, Chennai, Delhi, Gandhinagar, Guwahati, Hyderabad, Indore, Jodhpur, Kanpur, Kharagpur, Mandi, Mumbai, Patna, Ropar, Roorkee and Varanasi
National Institute of Technology [NITs]	30	Agartala, Allahabad, Arunachal Pradesh, Bhopal, Calicut, Delhi, Durgapur, Goa, Puducherry, Hamirpur, Jaipur, Manipur, Meghalaya, Mizoram, Nagaland, Jalandhar, Jamshedpur, Kurukshetra, Nagpur, Patna, Raipur, Rourkela, Sikkim, Silchar, Srinagar, Surat, Karnataka, Tiruchirappalli, Uttarakhand, Warangal
Indian Institute of Management [IIMs]	13	Calcutta, Ahmedabad, Bangalore, Lucknow, Kozhikode, Indore, Shillong, Rohtak, Ranchi, Raipur, Tiruchirappalli, Udaipur, Kashipur
Indian Institute of Science Education and Research [IISERs]	05	Kolkata, Bhopal, Mohali
Indian Institute of Engineering Science and Technology	01	Shibpur
Other Central Funded Higher Educational Cum Research Institutes	Approximately 150+	Pan India with 28 States and UT

Figure -3: Showing number of institutions in India.

Hence universities may include some elective on Cloud Computing and virtualization; however another approach may be put focus on Cloud Computing with as usual normal nomenclature of IT or CS or Computer Application and in Science platform the Degree may look like—

BSc/MSc/MPhil[Science]/ PhD [Science]— Information Technology [Cloud Computing]

BSc/MSc/MPhil[Science]/ PhD [Science]— Computer Science [Cloud Computing]

BSc/MSc/MPhil[Science]/ PhD [Science]— Electronic Science[*Cloud Computing*]

Information Field is changing rapidly and computing and IT is main ingredients in today's age. Thus Cloud Computing may also include in popular Information Programmes, which are listed as follows—

BSc/MSc/MPhil[Science]/ PhD [Science]— Information Science [*Cloud Computing*]

BSc/MSc/MPhil[Science]/ PhD [Science]— Information Studies [*Cloud Computing*]

BSc/MSc/MPhil[Science]/ PhD [Science]— Knowledge Management [*Cloud Computing*]

In India, Engineering and Technical education mainly comes with BE/BTech/ME/MTech nomenclature and thus programmes may be offered as follows—

BE/ BTech/ME/MTech— Information Technology [*Cloud Computing*]

BE/ BTech/ME/MTech— Computer Science and Engineering [*Cloud Computing*]

BE/ BTech/ME/MTech— Electronic and Communication Engineering [*Cloud Computing*]

BE/ BTech/ME/MTech— Software Engineering [*Cloud Computing*]

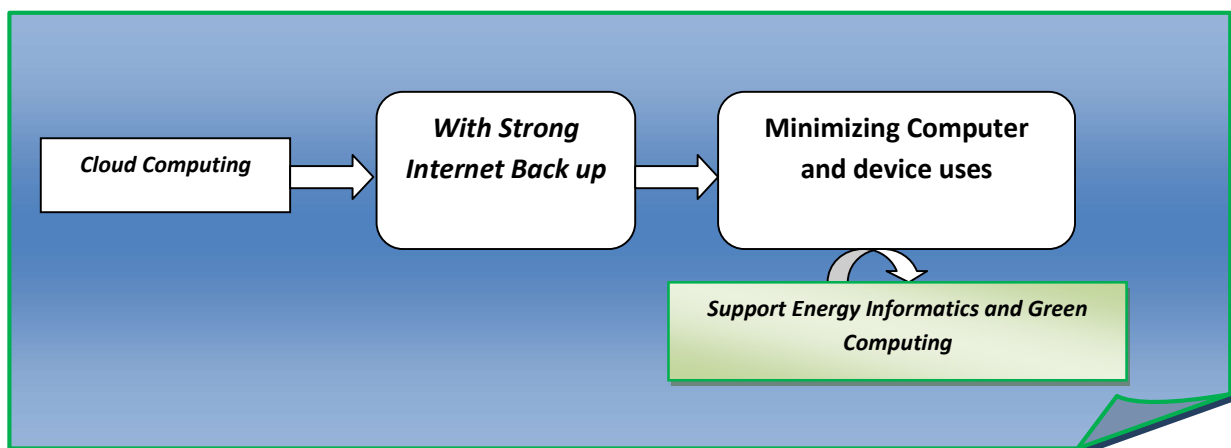


Figure -3: Cloud Computing and its possibilities as a healthy domain towards Energy Consumption

Initially Universities may adopt optional and elective papers to offer these subjects and later on specializations may be offered. In-fact specializations are very much easy to offer, as for this approach apart from existing faculty and paper or module only some guest faculty and additional paper may solve the problem [13, 18]. However depending upon need and future demand, universities may offer full-fledged *Cloud Computing and virtualization* in Science, Technology and Engineering platform and the probable degree in this respect may be offered as—

BE/ BTech/ME/MTech— Cloud Computing

BSc/MSc/MPhil/PhD— Cloud Computing

BCom/MCom— Cloud Computing

Universities and Engineering colleges may join with IT organizations and Vendor or IT player in cloud and core computing platform such as—

- ✓ CompTia
- ✓ VMWare
- ✓ Amazone
- ✓ Microsoft
- ✓ CISCO and so on.

Suggestion:-

- Specialization courses may be helpful for the graduates as they are able join in general IT and Computing jobs [as the nomenclature like BSc-IT [Cloud Computing].
- Proper planning for skilled manpower arrangement, administrative policy and placement may solve the current demand of Cloud Computing professional by introducing such proposed programmes and degrees.
- Adjunct Professors may be a good alternative for introduction of full-fledged Cloud Computing degree as also in such degree many other IT gradients are need to offer such as Networking, Database, Multimedia, Basic of Computing and Electronics and so on.

Conclusion:-

Technology is changing day by day, resource sharing is the main mantra in today's age for fund management and cost effective services. Today many organizations are moving towards public cloud as they no need to establish separate IT system in-house. However due to some secret and confidential reason some organizations are interested for combining services *i.e. Hybrid Cloud Computing* most interesting [14, 21]. Today some organizations and IT companies are offering free and open source services of virtualization of Data, storage and several software facilities with simple website registration and hence FOSS on Cloud Computing is emerging rapidly. Thus, educational need to find out the pulse of Cloud Computing needed in organization of all type and accordingly essential to prepare manpower for future Big Data Management [22, 29].

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