|| Volume 2 ||Issue 1 ||AUG 2017||ISSN (Online) 2456-0774
INTERNATIONAL JOURNAL OF ADVANCE SCIENTIFIC RESEARCH
AND ENGINEERING TRENDS

Profitable Service in Cloud Computing

Shaikh Md. Arshad [1], Prof. R. A. Auti[2], Prof. B. K. Patil[3]
Dr.BAMU University Aurangabad (M.S), Everest College of Engineering & Technology, Jatwada Road, Aurangabad, 431001, India[1 2 3]
Sma.arshad@gmail.com rajeshauti24@gmail.com cseroyal7@gmail.com

***Abstract*— Cloud computing is a computing base on internet where in the past, people would run applications or programs from software downloaded on a physical computer or server in their building, cloud computing allows people access to the same kinds of applications through the internet. This type of service is profitable for all like Customers, Service providers and Infrastructure providers, it is profitable to customer because it can run it's on demand service execution through Multiple Server Model, it is also profitable to Service provider and Infrastructure provider through renting strategy's, its include both long-term and short–term renting strategy's. Basically long-term renting strategy will damage large number of resources waste and short-term renting strategy will damage Money in short time. So for providing profitable Service in Cloud Computing with trusted quality of service we combine both long-term and short–term renting strategies through M\M\m+D queuing Model and performance of our renting strategy will calculate on Average charge and request ratio of particular service from multiple server Model and time period of request.**

Keywords: *Cloud computing, trusted quality of service, profit Maximization, Service Charge, service-level agreement, multi-server system, Queuing Model*

I INTRODUCTION

Cloud Computing is very rapidly growing trusted quality of service platform where every service is related to Cloud Computing like updating you Facebook status, bank transaction, and your email service is an example of Cloud Computing, approximately 90% of service are cloud base. So it is very helpful to earn the profit using cloud computing.

Cloud Computing is totally base on Internet Service [1] where computing resources and computing services and data are share [2].Cloud computing is an centralizes management system where resource and services are hosted and deliver to costumer on demand through internet service [3]

Cloud computing is based on distributed computing that's brings together administration of assets and administrations, what's more, conveys facilitated administrations over the Internet. The equipment, programming, databases, data, and all assets are focused and gave to purchaser's on-interest. Distributed computing transforms data innovation into normal products and utilities by the pay-per-use valuing model. In a distributed computing environment, there are constantly three levels, i.e., framework suppliers, administrations suppliers, and clients. A base supplier keeps up the fundamental equipment and programming offices. An administration supplier rent the resource's from the base suppliers and gives administrations to clients. A client presents its solicitation to an administration supplier and pays for it in light of the sum and the nature of the gave administration. In this paper, we are proposing the multi-server setup of an administration supplier such that its benefit is expanded. Like all business, the benefit of an administration supplier in cloud registering is identified with two sections, which are the expense and the income. For an administration supplier, the expense are renting cost give to base supplier and the electricity cost for the server, and the revenue is the service charge to customers. In general, a service provider rents a certain number of servers from the infrastructure providers and builds different multi-server systems for different application domains. Each multi-server system include different–different servers for different-different services and applications. Hence, the renting cost is proportional to the number of servers in a multi-server system.

The power consumption of a multiserver system is linearly proportional to the number of servers and the server utilization, and to the square of execution speed. The revenue of a service provider is related to the amount of service and the quality of service given to customer. To summarize, the profit of an administrations suppliers is mainly determined by the configuration of its service platform. To configure a cloud service platform, a service provider usually adopts a single renting scheme for doing such type of service administration supplier generally uses long-term rented service and short term rented service. If there are limited numbers of servers, some of the incoming service requests cannot be processed immediately. For Multiserver system configuration service request are added in to queue. However, the waiting time of the service requests in queue cannot be too long. In order to satisfy quality-of-service requirements, the waiting time of each incoming service request should be limited within a certain range, which is determined by a service-level agreement (SLA). If administration supplier gave the quality of service with guaranteed quality of service then, the service is fully charged, otherwise, the service provider serves the request for free as a penalty of low quality. To obtain higher revenue, an administration supplier should rent more servers from the infrastructure providers/ base suppliers or scale up the server execution speed to ensure that more service requests are processed with high service quality. However, doing this would lead to sharp increase of the renting cost or the electricity cost. But increased cost may gain penalty reduction. In conclusion, the single renting scheme is not a good scheme for service providers. In this paper, we propose a novel renting scheme for service providers, which not only can satisfy quality-of-service requirements, but also can obtain more profit.

II LITERATURE SURVEY

Cloud Computing and Emerging IT Platforms this paper, author characterize Cloud computing and give the structural planning to making Clouds with business sector arranged.Resource allocation by utilizing advancements, for example, Virtual Machines (VMs). Authors additionally give bits of knowledge on market-based resource administration systems that incorporate both client driven service management and computational risk administration to manage Service Level Agreement (SLA) - arranged resource distribution. What's more, authors uncover our initial musings on interconnecting Clouds for progressively making worldwide Cloud trades and markets. At that point, we display some illustrative Cloud stages, particularly those created in commercial enterprises alongside our present work towards acknowledging market-situated resource portion of Clouds as acknowledged in Aneka venture Cloud innovation. Besides, author highlight the distinction between High Performance Computing (HPC) workload furthermore, Internet-based service workload. We likewise depict a meta-arrangement foundation to build up worldwide Cloud trades and advertise, and show a contextual analysis of outfitting 'Storage Clouds' for superior substance conveyance. At last, author finish up with the requirement for joining of contending IT ideal models to convey our 21st century vision [7].

Leakage-Aware Multiprocessor Scheduling this paper, leakage-aware planning heuristics are introduced that decide the best exchange off between these three methods: DVS, processor shutdown, and finding the ideal number of processors. Exploratory results got utilizing a public benchmark set of assignment charts and genuine parallel applications demonstrate that our methodology lessens the aggregate vitality utilization by up to 46% for tight due dates and by up to 73% for free due dates thought about to a methodology that just utilizes DVS. Author likewise think about the vitality devoured by our booking calculations to two supreme lower limits, one for the situation where all processors ceaselessly keep running at the same recurrence, and one for the situation where the processors can keep running at diverse frequencies and these frequencies might change after some time. The outcomes demonstrate that the vitality decrease accomplished by our best approach is near these hypothetical limits [8].

Profit-drive schedule for cloud services with data access awareness this paper, authors address the compromise of these scheduling so as to clash targets service demands with the element production of service examples. In particular, author booking calculations endeavor to expand benefit inside the agreeable level of service quality indicated by the service buyer. Author’s commitments incorporate (1) the improvement of an evaluating model utilizing processor-sharing for cloud, (2) the use of this estimating model to composite services with reliance thought, (3) the advancement of two arrangements of service solicitation booking calculations, and (4) the advancement of a prioritization arrangement for data service planning to amplify the benefit of data service [9]

Energy and Performance Management of Green Data Centers this paper, author try to handle this deficiency by proposing a precise way to deal with amplify green server farm's benefit, i.e., income short cost. In such manner, authors unequivocally consider reasonable service level agreement (SLAs) that as of now exist between information focuses and their clients. This model additionally fuses different elements, for example, accessibility of neighborhood renewable force era at server farms and the stochastic way of server farms' workload. Moreover, authors propose a novel advancement based benefit expansion procedure for server farms for two diverse cases, without and with behind-the-meter renewable generators. Authors demonstrate that the figured advancement issues in both cases are arched projects; in this manner, they are tractable and fitting for down to earth execution. Utilizing different test information what's more, by means of PC reproductions, authors evaluate the execution of the proposed advancement based benefit expansion methodology and demonstrate that it fundamentally outflanks two practically identical vitality and execution administration calculations that are as of late proposed in the writing [10].

III PROPOSED SYSTEM

In this paper, a double resource renting plan is designed firstly in which short term renting and long term renting are joined going for the current issues. This double renting plan can viably ensure the nature of administration of all solicitations what's more, lessen the resource squander enormously. Also, an service framework is considered as a M\M\m+D lining model and the execution pointers that influence the profit of our double renting plan are dissected, e.g., the normal charge, the proportion of solicitations that need makeshift servers, et cetera. Thirdly, a profit amplification issue is planned for the double renting plan and the streamlined arrangement of a cloud stage is gotten by taking care of the profit boost issue.

To maximize the profit, a service provider should understand both service charges and business costs, and how they are determined by the characteristics of the applications and the configuration of a multiserver system. The workload of an application environment, the configuration of a multiserver system, the service level agreement, the satisfaction of a consumer, the quality of a service the cost of energy consumption, and a service provider's margin and profit. The two scheduling algorithms naturally follow. First-Fit-profit algorithm is to maximize profit when maintaining a target of customer satisfaction, while First-Fit-satisfaction algorithm is to maximize customer satisfaction while keeping a bound of unit profit. These scheduling algorithms are invoked when a service provider has pending requests in its waiting queue during auction sessions. Second algorithm we use here is Best-fit- Satisfaction algorithm that will help service provider to find out which customers are profitable for that by analyzing it requirement.

IV IMPLEMENTATION MODULES

4.1 Queuing model

We consider the cloud service platform as a multi-server system with a service request queue. The clouds provide resources for jobs in the form of virtual machine (VM). In addition, the users submit their jobs to the cloud in which a job queuing system such as SGE, PBS, or Condor is used. All jobs are scheduled by the job scheduler and assigned to different VMs in a centralized way. Hence, we can consider it as a service request queue.

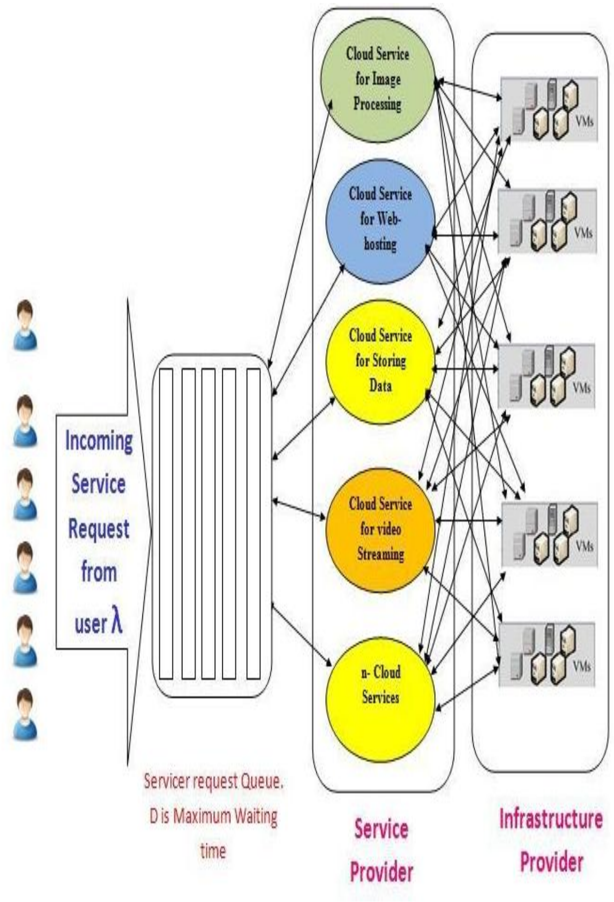

Figure 1: Architecture Diagram for Service

For example, Condor is a specialized workload management system for compute intensive jobs and it provides a job queuing mechanism, scheduling policy, priority scheme, resource monitoring, and resource management. Users submit their jobs to Condor, and Condor places them into a queue, chooses when and where to run they based upon a policy. An M\M\m+D queuing model is built for our multi-server system with varying system size. And then, an optimal configuration problem of profit maximization is formulated in which many factors are taken into considerations, such as the market demand, the workload of requests, the server-level agreement, the rental cost of servers, the cost of energy consumption, and so forth. The optimal solutions are solved for two different situations, which are the ideal optimal solutions and the actual optimal solutions.

4.2 Business Service Providers Module

Service providers pay infrastructure providers for renting their physical resources, and charge customers for processing their service requests, which generates cost and revenue, respectively. The profit is generated from the gap between the revenue and the cost. In this module the service providers considered as cloud brokers because they can play an important role in between cloud customers and infrastructure providers, and he can establish an indirect connection between cloud customer and infrastructure providers.

4.3 Cloud Customers

A customer submits a service request to a service provider which delivers services on demand. The customer receives the desired result from the service provider with certain service-level agreement, and pays for the service based on the amount of the service and the service quality.

4.4 Infrastructure Service Provider Module:

In the three-tier structure, an infrastructure provider the basic hardware and software facilities. A service provider rents resources from infrastructure providers and prepares set of services in the form of virtual machine (VM). Infrastructure providers provide two kinds of resource renting schemes, e.g., long-term renting and short-term renting. In general, the rental price of long-term renting is much cheaper than that of short-term renting.

4.5Algorithms DQG

//A Multiserver system with *m* server is running and waiting

B. A queue *Q* is initialized as empty
C. Event – A service request arrives
D. Search if any server is available
E. if true then
F. Assign the service request to one available server
G. Else
H. Put it at the end of queue *Q* and record its waiting time
I. end if
J. End Event
K. Event – A server become idle
L. Search if the queue *Q* is empty
M. if true then

N. Wait for a new service request
O. Else
P. Take the first service request from queue *Q* and assign it to the idle server
Q. end if
R. End Event
S. Event – The deadline of a request is achieved
T. Rent a temporary server to execute the request and release the temporary server when the request is completed
U. End Event

4.6 Algorithms FFS (First-Fit-Satisfaction)

// A multiserver system with *m* server is running and waiting
1: initial no server assign to service request
2: Event – A service request arrives
3: Search if any server is available
4: if true then
5: Assign the service request to one available server
6: else
7: Put it at the end of queue *Q* and record its waiting time
8: end if
9: End Event
10: Event –If a server assign check customer satisfaction and fix max profit
11: else
12: assign to another customer

4.7 Algorithms BFS (Best-Fit-Satisfaction)

// A multiserver system with *m* server is running and waiting
1:initial no server assign to service request
2:Event – A service request arrives
3:Search if any server is available
4:if true then
5:Assign the service request to one available server
6:else
7:Put it at the end of queue *Q* and record its waiting time
8:end if
9:End Event
10:Event –If a server assign check service provider satisfaction and which customers give max profit
11: else
12: check queue for next customers or call DQG algorithms again

Working of BFS algorithm and FFS algorithm is depend upon working of DQG algorithm but it also help service provider and customers to find out maximum profit and best service respectively.BFS algorithm work for service provider to find out which customer gives maximum bound of profit .it follow the working of DQG algorithm [11].FFS algorithm work for customers to find out best service within multiple server model it also follow the working of DQG algorithm and BFS algorithm

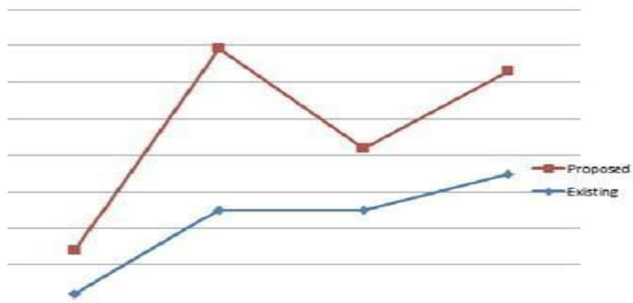

Figure 2: Result Analysis with Existing system

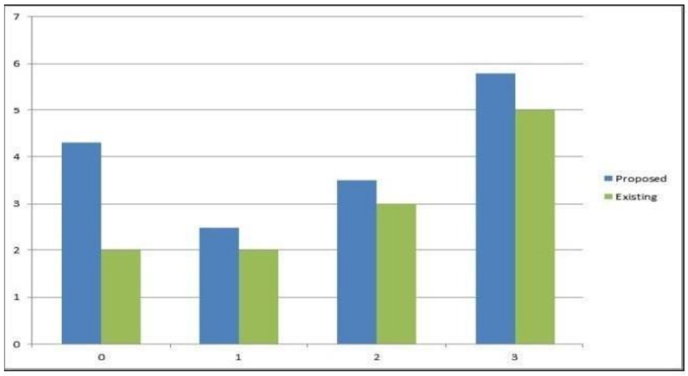

Figure 3: Result Analysis with Existing system

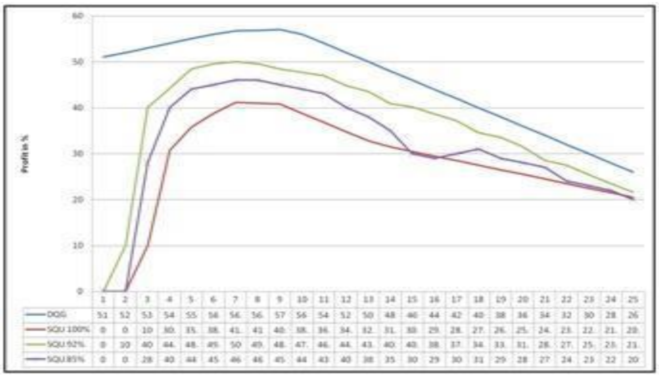

Figure 4: Result Analysis with Existing system

The profit of a service provider in one unit of time is obtained as

$$\text{Profit} = \text{Revenue} - C_{\text{long}} - C_{\text{short}}$$

Where,

$\text{Revenue} = \lambda\alpha\bar{r}$,

$\lambda =$ Rate of service requests arrival

$\alpha\bar{r} =$ The expected charge to a service request,

$$C_{\text{long}} = m(\beta + \delta(\rho(1 - p_{\text{ext}}(D))\xi s^{\alpha} + P^{*}))$$

$$C_{\text{short}} = \lambda p_{\text{ext}}(D)\frac{r}{s}(\gamma + \delta(\xi s^{\alpha} + P^{*}))$$

Where,

$$R(r, W) = \begin{cases} ar, & 0 \le W \le D \\ 0, & W > D \end{cases}$$

|| Volume 2 ||Issue 1 ||AUG 2017||ISSN (Online) 2456-0774
INTERNATIONAL JOURNAL OF ADVANCE SCIENTIFIC RESEARCH AND ENGINEERING TRENDS

Where a is constant which indicate price per one billion instruction D is Deadline for execution of request ar, is service charge when request executed within time.

According to SLA it is mandatory to execute the customer's request with deadline D.

The cost of a service provider depended on two think i.e. rental cost of physical recourses and energy consumption. The renting cost is depend on server available in the form of long term renting or in the form of short terms .The cost for energy consumption is calculated by electricity price and amount of electricity used. For this paper we adopted dynamic power model as follow

$P_d=N_{sw}C_LV^2f$

Where

N_{sw} is the average the average gate switching factor at each clock cycle,

C_L is the loading capacitance,

V is the supply voltage, and

f is the clock frequency

To achieve maximum profit the main objective is to choose the optimal number of fixed servers m and the optimal execution speed s to maximize the profit:

$$\mathrm{Profit}(m,s) = \lambda\alpha\bar{r} - \lambda p_{ext}(D)\frac{r}{s}\left(\gamma + \delta(\xi s^{\alpha} + P^{*})\right) - m(\beta + \delta(\rho(1 - p_{ext}(D))\xi s^{\alpha} + P^{*}))$$

Where, m = A multiserver system,

β = Long_term rental price of one server for unit of time

γ = Short_term rental price of one server for unit of time,

ξs^{α} = Power for speed,

P^{*} = Static Power Consumed by a server,

$p_{ext}(D)$ = *Stead state Probability that a request is assiged to a temp server*

V CONCLUSION

With a specific end goal to ensure the nature of administration demands and augment the profit of administration suppliers, this paper has proposed a novel Double-Quality-Guaranteed (DQG) renting plan for administration suppliers. This plan consolidates fleeting renting with long haul renting, which can lessen the asset squander extraordinarily and adjust to the dynamical interest of computing limit. A M\M\m+D lining model is manufactured for our multi-server framework with shifting framework size. And after that, an ideal configuration issue of profit augmentation is planned in which numerous elements are taken into contemplations, for example, the business sector request, the workload of solicitations, the server-level assertion, the rental expense of servers, the expense of vitality utilization, et cetera. The ideal arrangements are unraveled for two unique circumstances, which are the perfect ideal arrangements and the genuine ideal arrangements. What's more, a progression of counts led to look at the profit acquired by the DQG renting plan with the Single-Quality-Unguaranteed (SQU) renting plan. The outcomes demonstrate that our plan beats the SQU plan as far as both of administration quality and profit.

For the verification we conduct the following comparison between the optimal profit achieved by our DQG renting scheme and that of the SQU renting scheme. In this group of comparisons, λ (is request arrival rate) is set as 6.99, r is set from 0.50 to 2.0(Table 1)

TABLE 1: Comparison of the two methods for finding the optimal size, the optimal speed and Max Profit

		R	0.50	0.75	1.00	1.25	1.50	1.75	2.00
$\lambda = 6.99$	**Ideal Solution**	**Optimal Size**	2.5763	3.8680	5.1608	6.4542	7.7480	9.0420	10.3362
		Optimal Speed	0.9432	0.9422	0.9413	0.9406	0.9399	0.9394	0.9388
		Maximum Profit	24.0605	36.0947	48.1538	60.1962	72.2317	84.3121	96.3528
	Actual Solution	**Optimal Size**	3	4	5	6	7	9	10
		Optimal Speed	1	1	1	1	1	1	1
		Maximum Profit	23.800	35.7921	48.0870	60.1557	72.0928	83.1234	96.2340
	Relative Difference		0.7695%	0.8454%	0.14355	0.0789%	0.1927%	0.3754%	0.1349%

$\lambda = 7.99$	**Ideal Solution**	**Optimal Size**	3.1166	4.6787	6.2418	7.8056	9.3600	10.9346	12.4995
		Optimal Speed	0	0.9422	0.9413	0.9406	0.9399	0.9394	0.9388
		Maximum profit	24.0605	36.0947	48.1538	60.1962	72.2317	84.3121	96.3528
	Actual Solution	**Optimal Size**	3	4	5	6	7	9	10
		Optimal Speed	1	1	1	1	1	1	1
		Maximum profit	23.800	35.7921	48.0870	60.1557	72.0928	83.1234	96.2340
	Relative Difference		0.7695%	0.8454%	0.14355	0.0789%	0.1927%	0.3754%	0.1349%

REFERENCES

[1] M. Armbrustet al., "A View of Cloud Computing," Common. ACM, vol. 53, no. 4, 2010, pp. 50–58.
[2] K. Hwang, J. Dongarra, and G. C. Fox, Distributed and Cloud Computing. Elsevier/Morgan Kaufmann, 2012.
[3] J. Cao, K. Hwang, K. Li, and A. Y. Zomaya, "Optimal multiserver configuration for profit maximization in cloud computing," IEEE Trans. Parallel Distrib. Syst., vol. 24, no. 6, pp. 1087–1096, 2013.
[4] A. Fox, R. Griffith, A. Joseph, R. Katz, A. Konwinski, G. Lee, D. Patterson, A. Rabkin, and I. Stoica, "Above the clouds: A berkeley view of cloud computing," Dept. Electrical Eng. and Comput. Sciences, vol. 28, 2009.
[6] R. Buyya, C. S. Yeo, S. Venugopal, J. Broberg, and I. Brandic, "Cloud computing and emerging it platforms: Vision, hype, and reality for delivering computing as the 5th utility," Future Gener. Comp. Sy., vol. 25, no. 6, pp. 599–616, 2009.
[7] P. Mell and T. Grance, "The NIST definition of cloud computing. National institute of standards and technology," Information Technology Laboratory, vol. 15, p. 2009, 2009.
[8] K. Hwang, J. Dongarra, and G. C. Fox, Distributed andCloud Computing. Elsevier/Morgan Kaufmann, 2012.
[9] A. Fox, R. Griffith, A. Joseph, R. Katz, A. Konwinski,G. Lee, D. Patterson, A. Rabkin, and I. Stoica, "Abovethe clouds: A berkeley view of cloud computing," Dept.lectrical Eng. and Comput. Sciences, vol. 28, 2009.
[10] R. Buyya, C. S. Yeo, S. Venugopal, J. Broberg, and I. Brandic, "Cloud computing and emerging it platforms:Vision, hype, and reality for delivering computing as the5th utility," Future Gener. Comp. Sy., vol. 25, no. 6, pp. 599–616, 2009.
[11] P. Mell and T. Grance, "The NIST definition of cloud computing.national institute of standards and technology,"Information Technology Laboratory, vol. 15, p. 2009, 2009.
[12] Jing Mei, Kenli Li Aijia Ouyang and Keqin Li" A Profit Maximization Scheme with Guaranteed Quality of Service in Cloud Computing", 2015 IEEE

AUTHOR PROFILE

[1]**Shaikh Md.Arshad** received the B.E. degree in Computer Science and Engineering from Matsyodari Shikshan Sansthas College of Engineering and Technology, Jalna in 2011 and currently pursuing M.E (Computer Science and Engineering) from Department of Computer Science and Engineering, Everest College of Engineering & Technology, Jatwada Road, Aurangabad 431001, and India.

[2]**Prof.R A Auti** received the B.E and M..Tech. degrees in Computer Science and Engineering from Shri Sant Gajanan Maharaj College of Engineering, Shegaon and Jawaharlal Nehru Technological University, Hyderabad respectively

[3]**Prof B.K Patil** received the B.E and M.E. degrees in Computer Science and Engineering from Matsyodari Shikshan Sansthas College of Engineering and Technology, Jalna in 2012 and ME from Everest College of Engineering & Technology, Jatwada Road, Aurangabad 431001, India, respectively.