Approach Towards Expert Systems to Increase the Quality of Services in Cloud Computing

Aadarsh Malviya[1], Sweta Rai[2], Vivek Kumar[3],Gyani Rai[4]

[1] *Assistant Professor, Noida International University, U.P, India*
[2] *Research Scholar,U.P, India*
[3] *Vice Chancellor,Quantum University, Roorkey, Uttarakhand, India*
[4] *Head of Deaprtment, Mahadeo Singh College, Bihar, India*

ABSTRACT

Our research on the topic "Towards Expert Systems for Enhancing the Quality of Services in Cloud Computing" has brought a new smell in the world of Technology. In our research we have diverted the path and provided a better substitute for the security, reliability, availability and speed in the technology. The main firm who is responsible for the security, reliability, availability and speed in Cloud Computing is the Human Brain. People who are the entrepreneur or developer of the Cloud decide the authentication level and the features provided to the user. The abstraction of the technology entirely relies on the developer of the Cloud. In results the user has to compromise to some extend and he has to make himself addicted to the Cloud Application provided to him. In our research we have proposed an alternative to these problems. Instead of any human brain we have left the security decisions and authentication part on Expert Systems.   In results we have a technology that has better availability of resources, more reliable technology, high security and less time taking. This technology proves itself better than the technology we have currently as it uses less man power in less time. Our research has also given future scope who wishes to work on this technology and extend the level of Expert system and provide a better Technology.

Keyword : - *Expert Clouds,Dynamic Server,IAAS as a Model,PaaS as a Model,SaaS as a Model*

1. INTRODUCTION

Cloud Computing has become the base of Computer Science. It is a technology which rules the computer system by making use of the resources like networking, hardware and Application. It has attracted millions of users and motivated the users to store their data online. Since the data is stored on platform which can be reached by everyone and is globalization High security is needed to store the data. We randomly use password and other locking system to make our data secured but that provides security just to keep one calm. In our researched we have made an approach towards Expert Systems. This reduces the human effort and leads us to a reliable technology with high speed and security. When we look to our practical life we can easily count the problems we face in Cloud Computing. Our Research started keeping in the mind the problem which is being faced by the user. We had an aim to improve the Quality of the services offered by Cloud Computing. The general topic in concern was Speed with security .When we make something global and common for every user there is a chance of data being misplaced or stolen. Moving forward we first decided to mark all the negative point of the current technology. Our research enabled us to point few things which needed the favour:

1. Data Security and Speed.

2. Collaboration Issues

3. Switching Cost.

4. Availability of Resources

5. Reliability of the Technology

6. Time Consuming

1.1 PROPOSED METODOLOGY

In our working model we have shown how we have formed such rule based protocol and considered the different abstraction level. Our next expert techniques which we have considered in our proposal is Evolutional Computing. It is based on the problem which has been raised previously and we form a rule according to the solution. In this we have known set of solutions and transfer the entire problem to the section which deals with it .In our next section we have shown how we get the quality parameters as output. Our next expert technique is neural network. Our proposal aims to design and artificial brain which can manipulate the problems as a human brain do. It is a term which is used to investigate how biological nervous systems accomplish the goals of machine intelligence but while using radically different strategies, architectures and hardware and to investigate how artificial neural systems are designed that try to emulate some of those biological principles in the hope of capturing some of their performance. Probabilistic computing is Based on or adapted to a theory of probability. It refers to a model where there are multiple possible outcomes, each having varying degrees or certainty or uncertainty of its occurrence. It is directly associated with randomness.

1.2 IAAS AS A MODEL

We have proposed the implementation of Expert techniques on IaaS(Infrastructure as a Service). We have considered IaaS as a model which covers the part of Servers, Routers, Network Equipments, Hardware Based Load Balancing .These four things are the pillars of IaaS. We have four techniques of Expert System. We have defined IAAS as a model and defined four services of IaaS. Abstracted Infrastructure, Service as a Speed, Flexibility as a Speed and control as a speed.

1. Abstracted Infrastructure makes the user unaware of platform running at the background. This extends the security issues in Cloud Technology.

2. Speed as service is the most important key feature of IAAS. It handles the processing speed of the request send by the client. It takes care of the processor running in the back ground. The processing speed of the request depends on the processor.

3. Flexibility as a Service is another key feature of IAAS. It can be implemented in any environment and can be moved from small to larger scale. This feature attracts the Entrepreneur. It provides the facilities from big to small organization.

4. Control as a Service: IAAS gives the overall control of the Cloud to the Administrator and allows him to maintain his security status.
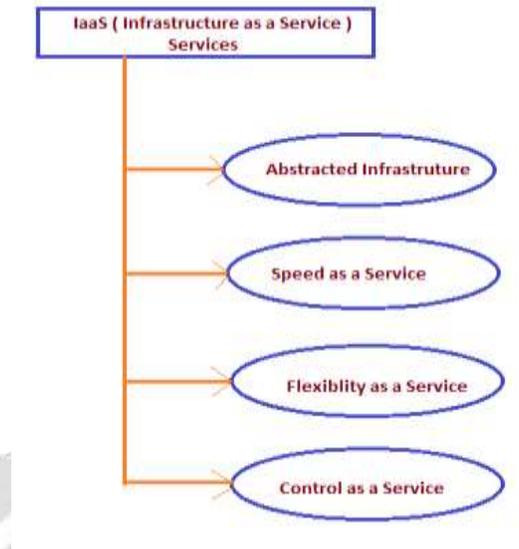
Fig. 1 IAAS Model

2. EXPERT SYSTEM ON IAAS

Our proposed technique on IAAS has four expert techniques on IAAS.I have summarized the entire thing and shown as a single caption. We have proposed the implementation of Fuzzy Computing to increase the Quality Parameters of IAAS. In this section we just remove all the confusing data concerning to the server and hosting .The result at this level is that we get exact data with the exact address, removing all the illegal connections decreasing the volume of Traffic. As a result we get fast and Quality Service. In our further step we have proposed the implementation of neural network in IAAS.

Neural Networks deals with implementing brain strategy. This finds its application in Cloud Hosting, Developing Server, forwarding IP Address to the Domain, Application Hosting. The security issues are dealt in this level where all the data is made public with hiding the internal details. Storage application is on the server side and as the client send the request the data is being uploaded to the clients system. Here it comes the concept of having a Static or Dynamic address. The Concept of having a static address is stable and friendlier to the users. While the Concept of Dynamic is secured and increases the cost to the Cloud Owner. Implementing Neural Technology and developing a neural network supports the feature of security with users friendly without affecting the speed .The result of this is we get a stable platform which is more scalable and friendly it supports the small organization in increasing and also a large organization to develop its new branch with less cost.

In our next level we have proposed the implementation of Evolutionary Technique on IaaS. At this level we deal with error concerned with hacking or leakage of Data or due to tracking to address by illegal source. So in this we keep track of all the address with the backup. We keep removing illegal contacts or use of any external or unknown tool. This keeps the data secured and helps the user for a secured Transaction. It finds its application in banking system by Security as well as threats are increasing. Implementing Evolutionary Computing results in the Quality parameters of IAAS. In our next level we have proposed the implementation of the Probabilistic Parameters to get the Quality services of IAAS. In this we deal with risk handling .Calculation of all the risk has been done at this level .There is risk of hacking so the concept of dynamic configuration has been implemented. There is a Risk of overload and illegal tampering with handling with the data. Probabilistic Computing sorts such problem and provides the quality Services of IAAS.
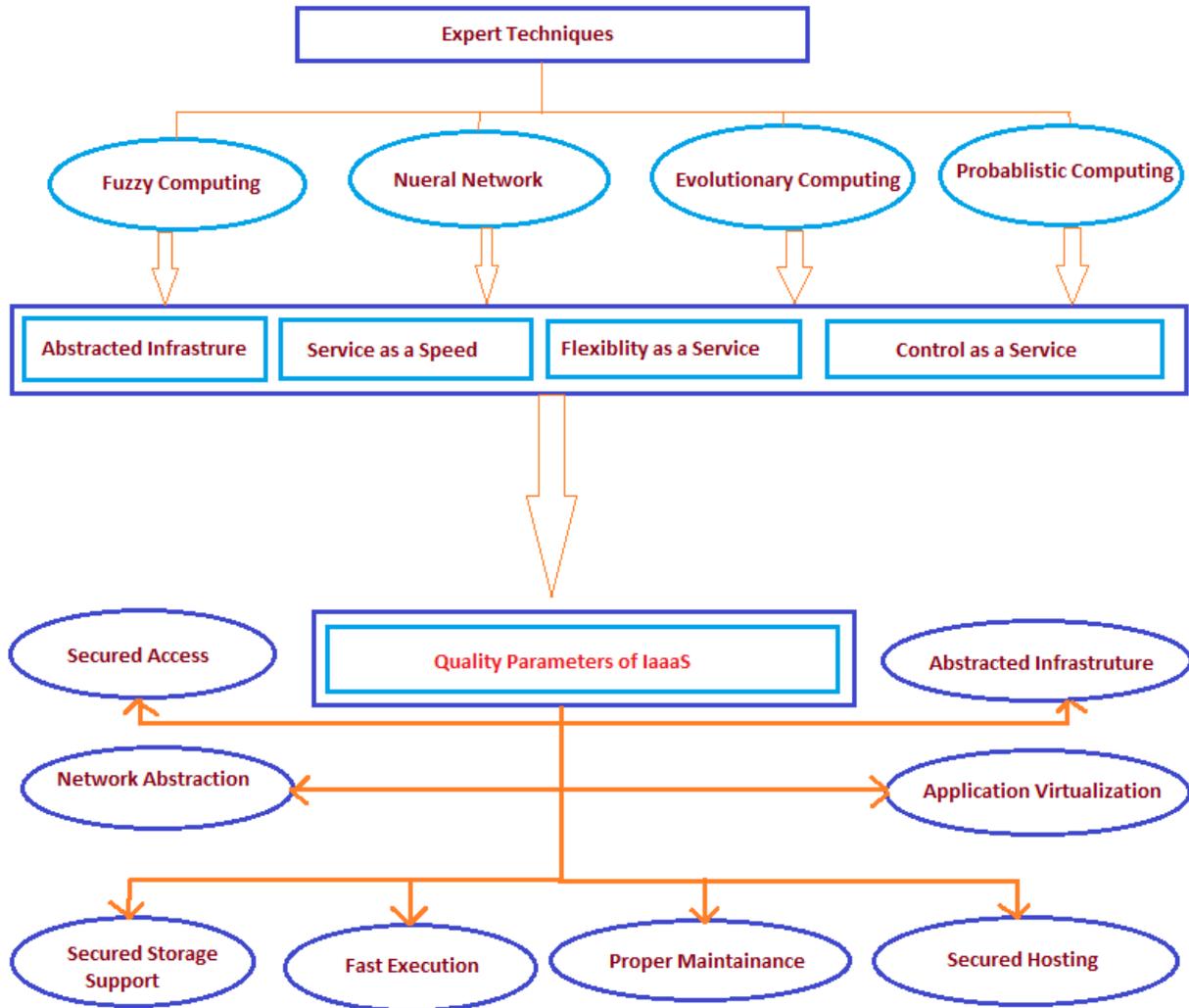
Fig.2 Expert System on IAAS

2. PROPOSED EQUATION IN IAAS

We have already seen the quality parameters of IAAS on implementation of four Expert techniques .We have shown the parameters in the following equation:

Quality parameters of IAAS = $I_1 + I_2 + I_3 + I_4$

$R(I) = I_1 + I_2 + I_3 + I_4$

$R(I) = f(I_1, I_2, I_3, I_4)$

Relation R on IaaS sums up with four Quality Parameters I_1, I_2, I_3, I_4. As a results we get the Final output in R(I).

We have four techniques .Fuzzy Computing denoted as F, Nueral Network Denoted as N, Evolutionary Computing Denoted as E and Probablistic Computing denoted as P.

We sum up the relations and implement it in IAAS.

R (F + N + E + P) $\implies$ R (I) = R (AI + SS + FS + CS)

= RF + RN + RE + RP $\implies$ RAI + RSS + RFS + RCS

In results we get on implementation

RF(RAI + RSS + RFS + RCS) + RN (RAI + RSS + RFS + RCS) + RE(RAI + RSS + RFS + RCS) + RP(RAI + RSS + RFS + RCS)

= RF RAI + RF RSS + RF RFS + RF RCS + RN RAI + RN RSS + RN RFS + RN RCS + RE RAI + RE RSS + RE RFS + RE RCS + RP RAI + RP RSS + RP RFS + RP RCS

= R (F AI + F SS + F FS + F CS + N AI + N SS + N FS + N CS + E AI + E SS + E FS + E CS + P AI + P SS + P FS + P CS)

= R (I_1, I_2, I_3, I_4) ---------- Eq. VM (1)

R Stands for Relation

AI stands for Abstracted Infrastructure

SS Stands for Speed as a Service

FS Stands for Flexibility as a Service

CS Stands for Control as a Service

3. PAAS AS A MODEL

We have proposed PaaS as a Model in which we have further proposed two services of PaaS .Software Development as a Service and Middleware as a Service. In Software Development as a Service we have taken Software as a Cloud and Developers frequently provide updates and upgrade. Middleware as a Service refers to the operating system or any interface which leads the connection between the hardware and the user. Operating system is a platform provided where one can work and chose his platform according to his convenience. We have shown the services of PaaS in the following figures:
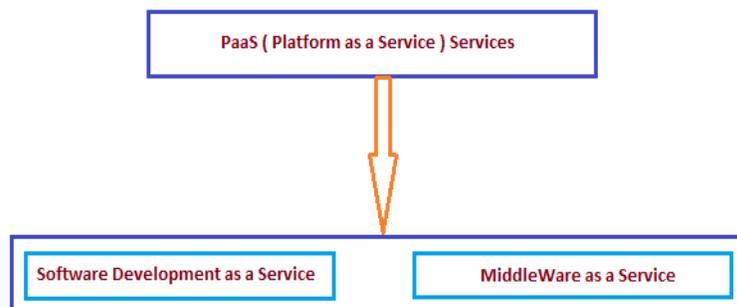

Fig. 3 PAAS as a Model

4. EXPERT SYSTEM ON PAAS

When we talk about PaaS We have to consider the Software Development and Operating System or any middleware of the system. In any organization software is being developed to deliver it to the clients and fulfill the needs of the clients and middleware acts as an interface which allows the user to make the system understand his commands. Whether it is a application or Middleware we frequently get updates that has to be reached to the user and also reduce the in going and outgoing cost of the Application. Our proposed methodology is to implement four expert techniques on PaaS. Implementing expert techniques sort out the problem to some extend but opens a chance of lock in for the user as flexibility of application might not meet the needs of some users. In this following figure I have shown the quality parameters of PaaS on implementation of Expert techniques.
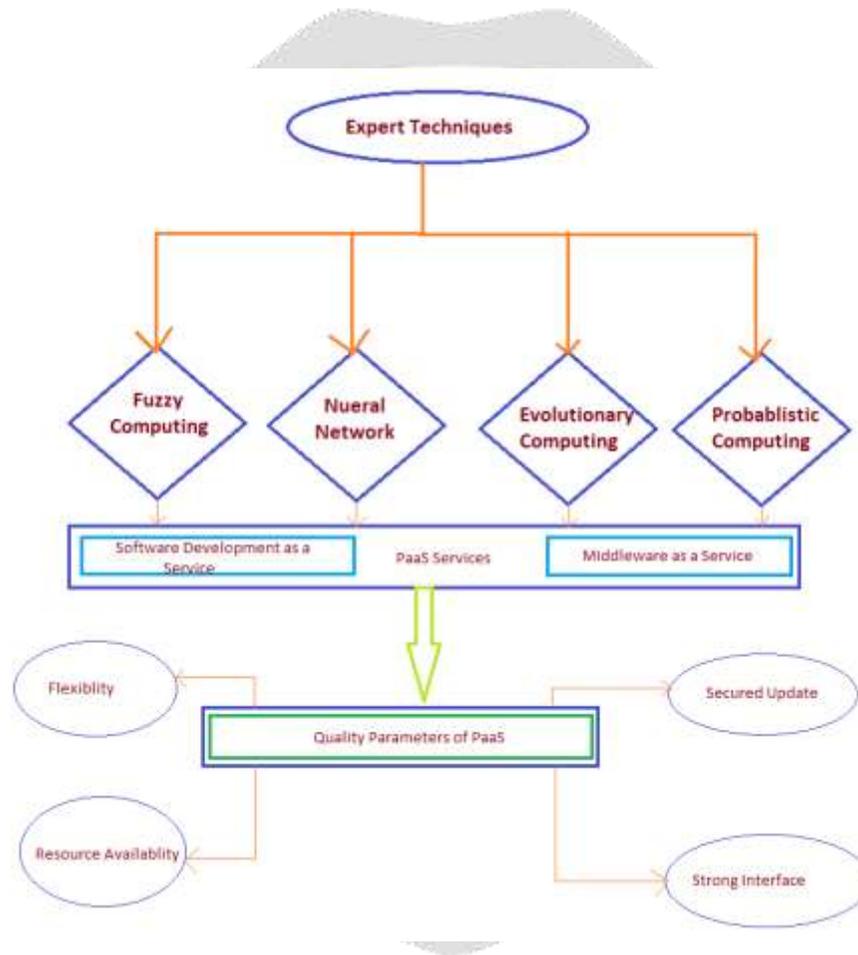
Fig.4 Expert System on PaaS

4.1 PROPOSED EQUATION ON PAAS

We have shown the entire proposal in our equation which is as follows :

Our relation is as follows :

$R (P) = f (P_1 , P_2 , P_3 , P_4)$

P is the quality parameters and P_1 , P_2 , P_3 , P_4 are different parameters of PaaS.

Implementing Expert Systems

$R (F + N + E + P) \Longrightarrow R (P) = R (P_1 + P_2 + P_3 + P_4)$

$=> R (F + N + E + P) => R (Fl + R + S + I)$

$= > RF + RN + RE + RP => R\ Fl + RFR + RS + RI$

Implementing:

⇨ RF (R Fl + RFR + RS + RI) + RN (R Fl + RFR + RS + RI) + RE (R Fl + RFR + RS + RI) + RP (R Fl + RFR + RS + RI)

⇨ R (F Fl + F FR + F RS + F RI + N Fl + N FR + N S +NI + E Fl + E FR + E S + E I)

⇨ $R (P_1 + P_2 + P_3 + P_4)$ ….. Eq. VM (2)

Fl Stands for Flexiblity
FR Stands for Flexible infrastructure
S Stands for Secured Update
I Stands for Strong Interface
F Stands for Fuzzy Technology
N Stands for Nueral Network
E stands for Evolutionary computing
P stands for Probablistic Computing

5. RESULTS ON PAAS

As a result we get the quality parameters of PaaS. We get secured update. The updated released by the developer for software can be delivered to the client in a secured way. User gets a strong interface between the system and the user. User gets a flexible infrastructure which he can change accordingly to his use. Apart from this user finds high resource availability .This in results adds high quality to the platform. PAAS stands as one of the most popular client server model where clients interaction is highly required.

6. SAAS AS A MODEL

Software as a Service as the name specifies is a model to provide user with developed application. In our proposal we have considered the working of SaaS same as we get with ROM (Read Only Memory).In our model we have proposed three services of SaaS as Web Based Service, Storage as a Service, Business Application as a Service.
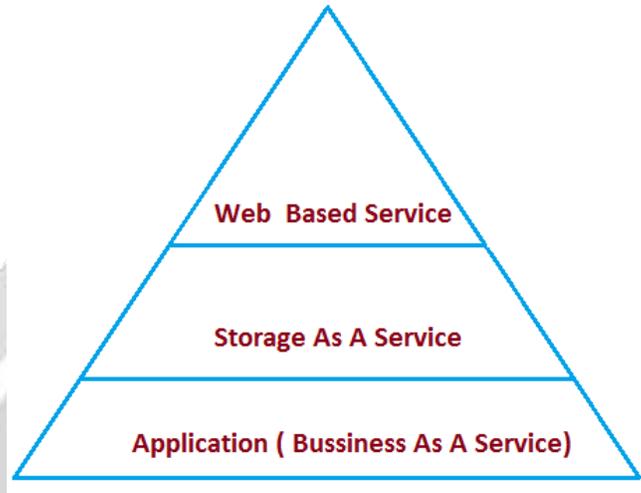

Fig. 5 SaaS Model

7. EXPERT SYSTEM ON SAAS

According to our proposed model when we implement Expert techniques on SaaS we get quality parameters of the services of SaaS. In SaaS We deliver three types of Services Web based Service, Storage as a Service and Business Application as a Service.
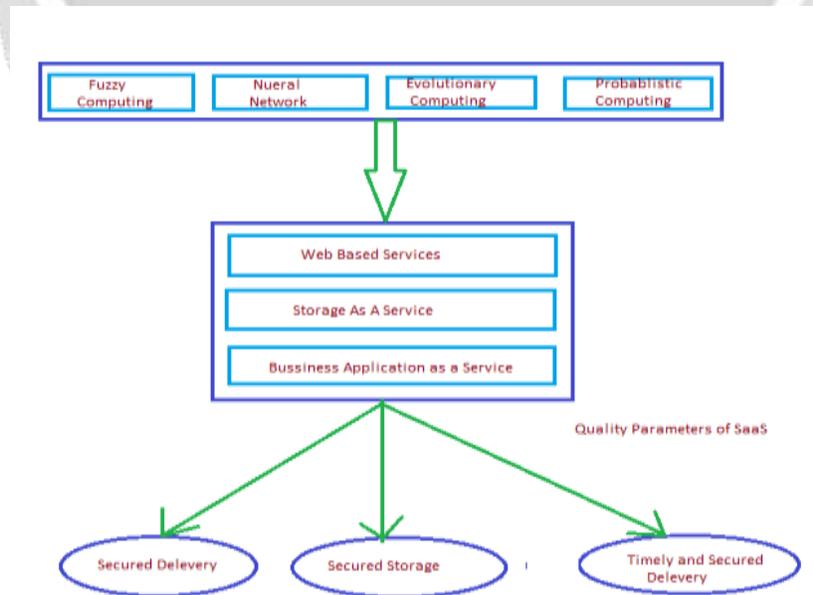

Fig. 6 Expert System on SAAS

8. PROPOSED EQUATION ON SAAS

We have shown our proposed methodology in terms of Equation as follows:

$$R(S) \implies R(S_1 + S_2 + S_3)$$

Relation S (S stands for Software As A Service) results in Relation $S_1 + S_2 + S_3$. S_1 Stands for Quality parameters of SaaS which is Web Based Services further represented as W , S_2 Stands for Quality parameters of SaaS which is Storage as a Service further represented as SS and S_3 Stands for Quality parameters of SaaS which is Business Application as a Service further represented as BA.

Expert System being implemented on SaaS.

$$R(E) \implies R(S)$$

- $\Rightarrow$ $R(F + N + E + P) \implies R(S_1 + S_2 + S_3)$
- $\Rightarrow$ $R(F + N + E + P) * (S_1 + S_2 + S_3)$
- $\Rightarrow$ $FS_1 + FS_2 + FS_3 + NS_1 + NS_2 + NS_3 + ES_1 + ES_2 + ES_3 + PS_1 + PS_2 + PS_3$
- $\Rightarrow$ $W + SS + BA$ …………….. Eq.VM (3)

9. RESULTS AND CONCLUSION

As our proposed methodology of implementing expert system on the services of Cloud Computing we get quality parameters of each services resulting high availability of resources, secured server, high speed and reliable technology. As per research states "Towards Expert System in Enhancing the Quality of services in Cloud Computing ,we taken the world to the technology which acts as a human brain. The work becomes easier, faster and reliability of technology increases. The implementation of Expert System has resulted in highly sensitive and progressive response by the clouds. The cloud is meant to fulfill the requirement of an entrepreneur as well as the customers. Our aim is to develop an intelligent Cloud which can work and can chose the services at its own without wasting time and extra cost. Often we have seen the user is not satisfied with the service and tries to switch from one server to the other and in every server he faces one or the other problems. There is no overall solution to the problem and user has to face the problem. This results in the loss of an Entrepreneur. We would work in sorting out this types of problems where are user need not to switch from one server to the other and can be given a proper choice .The other step which will be involved in this will be that there will be interconnections between the clouds so that the user of one server can access the application of other servers and would just pay for the thing that he used. We have limitless application running currently .The current demand is to develop a reliable cloud which proves the user with availability, security and stand alone resources. During our research we have also worked on dynamic configuration. Which further extends our topic in terms of security.

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