An effective model for e-Governance using Cloud computing-(eGaaS) e-Governance as a Service

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Abstract— **The objective of this paper is utilize the cloud computing using the e-Governance and discuss effective use of e-Governance with the help of ICT (Information and Communication Technology). e-Governance helps to the all government department move to cloud using e-governance based cloud. e-Governance is the application of ICT (Information and Communication Technology). e-Governance provide faster way to communicate all government department through the cloud. cloud is the best way to integrate the all department using the e-Governance. e-Governance is the services provided by the government to the citizens that improve the service delivery and save the time. In this paper we discuss a delivery model that integrate the cloud computing facility with the help of e-Governance. There are many e-Governance applications use in cloud. In this paper we integrate all services of e-Governance through the cloud and propose a model for e-Governance application that is use in cloud.**

Keywords— **e-Governance; Objective of e-Governance; Cloud Computing; Classification of cloud computing; e-Authentication; eGaaS (e-Governance as a Service)**

I.   INTRODUCTION

The prime concern to establish this model is effective use of e-Governance in the field of cloud computing. e-Governance is the application of Information and Communication Technologies to transform the efficiency, effectiveness, transparency and accountability of informational and transactional exchanges within government between govt. and govt. agencies of National, State, Municipal and Local levels, citizen and business, and to empower citizen through access and use of information[1].

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e-Governance is the term which we can use the government website and access the information from government website or government portal that effective manner by the use of information and communication technology (ICT) and its component. through e-Governance as a Service with cloud computing it provides the better access to Government information by the citizen, employee and user. Government generates large amount of data and information and much of it potentially useful to individuals and business. e-government publish government information online document, forms, tender, online bill and payment, submitting online form. This model is facilitate the all government department to interconnect through the cloud with effective model. e-Governance has to develop gradually as a model of governance of information and communication technology in the process of Government interaction with citizens and business in government operations with the objective to ensure the highest standard of services to the citizens by access to select the selected government information and interfaces for communicating with government functionaries.

II.   OVERVIEW OF e-GOVERNANCE

e-Governance is the services provided by the government to citizens electronically. e-Governance is the application of ICT (Information and Communication Technology) that provide by the all government department through better service delivery to the citizens. Through E-Government, the internet and the world-wide-web are used for delivering government information and services to the citizens[2]. e-Governance provide the facility of ICT applications utilize the e-democracy and e-administration. A major focus of e-government is in expanding agencies presence on the Web and making government sites more useful[3]. e-Governance provide the facility that application of Information and Communication and Technology in Government to provide for citizens with better service delivery. The Indian Government is using IT to facilitate e-Governance[4]. e-government provide the facility to from the different area like- e-commerce, financial, higher education and central and state government.

III.   OBJECTIVE OF E-GOVERNANCE

The scope and need of e-Governance in India is increasing along with the numbers of users and

services[5].The main objective of the e-Governance is provide the awareness of the internet and mobile based online facility to the citizen that they can access the government information easily. The term e-governance emerged in the late 1990s and has become a viable concept as a result of the advancement and proven reliability of ICT[6]. The motive behind the e-Governance is the better use of Information and Communication Technology by the citizens. There are some objective which helps to make e-Governance effective and convenient:

- Increase the awareness to citizens for internet based environment.
- Make the government work paperless manner
- All work done by government is fully digital
- Improve G2C, C2G, G2G, G2B interaction
- Improve the empowerment of citizen participation
- Increase the transparency of the government
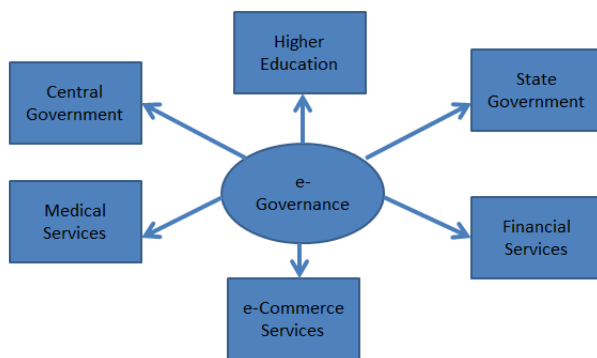- Reduce the communication cost

Figure 1: Architecture of e-Governance

IV.   CLOUD COMPUTING

Cloud computing is the service that provide the best utilization of the computing resources. Cloud computing uses the different servers that store the huge amount of data and provide the facility to access the data anytime and anywhere. cloud computing allows consumers and businesses to use applications without installation and access their personal files at any computer with internet access[7]. Cloud is refer to around computer network infrastructures. Cloud computing is the service that what the user want and pay for that service online. Through the cloud service model user can access the service on demand and save the time and communication cost. The basic principle behind cloud computing is that it assigns the computing resources in the great number of distributed computers rather than local computers or remote servers[8]. Cloud computing sharing resources through the network which is scalable that referring for internet. Cloud

provide the virtualization and grid computing that give better service at the run time. Cloud computing encompasses any subscription-based or pay-per-use service that, in real time over the Internet, extends ICT's existing capabilities [9]. Cloud computing is the computing based technology that dynamic scalable through the internet. Cloud computing is based on basically IaaS (Infrastructure as a Service), PaaS (Platform as a Service), SaaS (Software as a Service).

V.   CLASSIFICATION OF CLOUD COMPUTING

Cloud computing are classified into three classes based on abstraction level.

A.   Infrastructure as a Service (IaaS)

Infrastructure as a Service (IaaS) [10-11] is the delivery of computer hardware (servers, networking technology, storage and data center space) as a service. Infrastructure as a Service (IaaS) manages the resources by the virtualization technique. Customer can install the software their own data center by pay for the service. IaaS provide the facility of dynamic scaling which the customer is free from scaled the service based on the need of the customer.

B.   Platform as a Service (PaaS)

Platform as a Service (PaaS) is the service environment which gives the facility to cloud delivered services. PaaS is the structured by the webhosting companies that full of software stacks for the software development websites. PaaS is inherently multi-tenant and naturally supports the whole set of Web services standards and is usually delivered with dynamic scaling[12]. PaaS is free from dynamic scaling which is the customer can scaled up and down the software. There are some example of PaaS is Google App Engine, Etelos and Qrimp. PaaS is provide the API (Application Programming Interfaces) which is use for the cloud computing services. In PaaS cutomer does not need to install the software from the cloud computing through the internet.
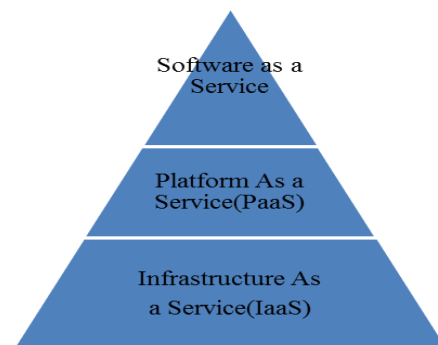

Figure 2: Classification of Cloud Computing

C.   Software As a Service (SaaS)

Software As a Service(SaaS) is the service that is provided in the cloud. The service access by the customer is not need to install the software with the local machine and store the data in the cloud and customer access the software through online. through the SaaS customer pay the service that they want and reduce the cost of software. Using the SaaS software package is automatically update by the cloud service. Examples of SaaS today are Google's Gmail, Microsoft's Office Live and Cornerstone On Demand etc[13].

VI.   PROPOSED ARCHITECTURE
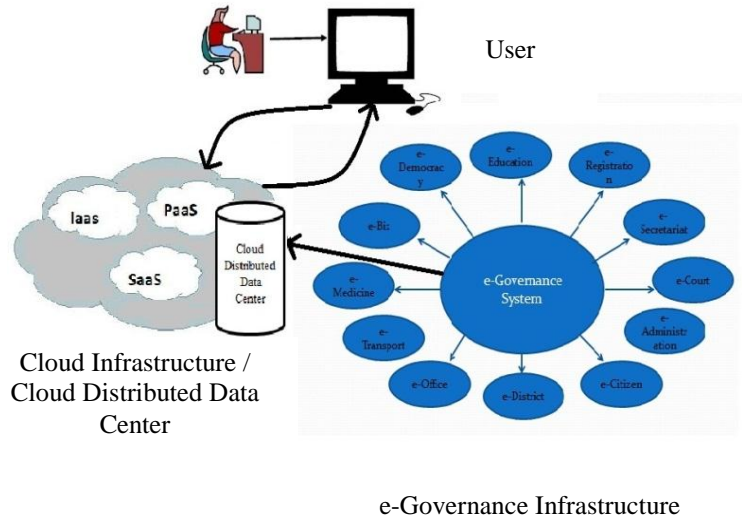
eGaaS (e-Governance as a Service)

The proposed Architecture we discuss the effective use of cloud service using the e-Governance as a Service. There are huge amount of data use by the different government department. This data we can store in the cloud distributed data center which is located in cloud infrastructure. Data is distribute through central server to the other server which located the different region. The cloud server provider facilitate the cloud model IaaS (Infrastructure as a Service), PaaS (Platform as a Service) and SaaS (Software as a Service) this service use by the component of e-Governance and control by Distributed Cloud Data Centre.

Once the data is entered in the central server by the government department, it is stored in the different server through the cloud distributed data center. So the user can take the benefit form the e-Governance services as well as cloud computing in one model. This model provide the cloud infrastructure and a propose framework with stakeholder use the e-Governance service together, the user, customer and employee and use the e-Governance services from the cloud.

Using the propose model user can access the government facility from the cloud infrastructure, the all data for e-Governance is stored in the cloud so when user want to access the government data they take the data from the cloud anytime and anywhere. It save the time of user and data will be reliable. if the one server is fail then we can access the data from the another server so the data will be available at any time. The framework of e-Governance with cloud infrastructure use by the user, customer and employee with effective interaction between e-Governance and cloud infrastructure.

The structure of Software as a Service we put the new term which e-Governance services use by the e-Authentication method that is the user access the data from cloud through the secure channel. The structure of SaaS includes the

cloud distributed data center that controls the other distributed server which located at cloud infrastructure SaaS.

Cloud Infrastructure / Cloud Distributed Data Center

e-Governance Infrastructure

Figure 3: e-Governance as a Service

There are different department they can use the effective e-Governance with cloud infrastructure which are given below:

- e-Education
- e-Registration
- e-Secretariat
- e-Court
- e-Administration
- e-Citizen
- e-District
- e-Office
- e-Transport
- e-Medicine
- e-Biz
- e-Democracy
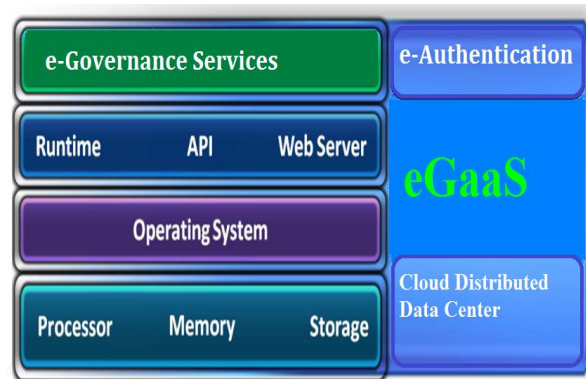
Figure 4 : Technical architecture of eGaaS

In the technical architecture of eGaaS we have to use e-Authentication which is verifying the identity of the user using electronically. To use e-Authentication in cloud computing accessing the government information by the secure channel, we can use the one, two and three factor authentication according to availability of user credential.

Cloud Distributed Data Center is the hub of information which collect the information from the all department of government agencies and locate the information in different region of availability of the user.
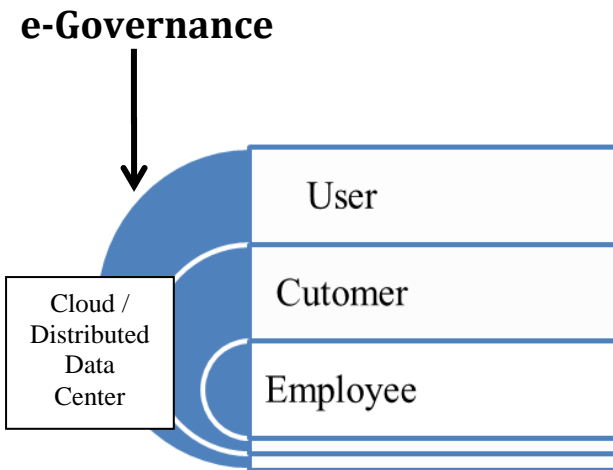

Figure 5: Framework for e-Governance with Cloud

Advantage for e-Governance by using eGaaS are given below:

1) Higher throughput

e-Governance as a Service provide in cloud based infrastructure which maximize higher throughput to allow several concurrent applications.

2) Minimal Storage cost

e-Governance as a Service provide the minimal storage cost because different server are control by the cloud distributed data center.

3) Minimal Communication cost

Using e-Governance as a Service with cloud to provide the minimal communication cost because data is available the nearest server every time.

4) Minimize response time

e-Governance as a Service minimize the response time because all data will be replicate all server through the cloud distributed data center.

5) Recoverability

If one server will be fail so we can access the data other server. So our data will be safe and we can recover our data through the other server.

VII.   CONCLUSION AND FUTURE WORK

In this paper we discussed the model of effective e-governance with cloud infrastructure and discussed the interaction between e-Governance and cloud computing. Using the model user can access the data from different government department through the different server using cloud Distributed Database server. Government data is replicate the different server which is reliable and interm of availability. The user can use the government information using cloud facility which is IaaS, PaaS and SaaS. These models give the better service delivery to the citizens and reduce the communication cost. Government need the better framework for the e-Governance services where the e-Authentication process should be use so the citizen can access the government information through a secure channel and get the better service delivery.

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