



## Governance Through Cloud in India (GCI)

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**Abstract:** E-Governance is the most popular and reasonable medium nowadays to provide better governance to their citizen via internet. It helps to increase the quality of the service delivery and at the same time it consumes less time. But in the rural areas E-Governance is hard to deliver because of scarcity of resources and infrastructure. Therefore, in this paper we are delivering a model via cloud computing to provide E-Governance in rural sector, considering India as the major point. Cloud Computing is also a growing field because of its resource optimizing characteristics. This paper will deal with the existing state of e-governance and various methods adopted by the states for its implementation and also the initiatives taken in this regard in India. There are four pillars derived for the delivery of services in e-governance and they shall be implemented using cloud computing.

**Keywords:** E-Government, Cloud Computing, Electronic Administration, E-Governance Services, Cloud Services

### I. INTRODUCTION

E-Governance is a form of governance where government services are provided through electronic medium. Electronic medium is nothing but connecting the services through the internet. E-Governance is a much faster way to provide service. It provides much more efficient and effective government services to the people. Both Government and citizen are benefitted at both the end. It also ensures transparency between Government and its citizen, which gives a sense of smoothness to the Government machinery. E-Governance needs a better integration between the government policies and electronic models and practices. Riley in his definition of E-Governance state that it provide better relation among government and its people, providing much more opportunity for expression.[13]

There is a vast difference between E-government and E-governance. Government provides governance. Government is a working body whereas governance describes form of working by the government. Keohane and Nye describe government as a subset of governance. They further explained that government act under the authority given by the governance [12].

In India, through ICT (Information and Computer Technology) many E-Governance initiatives have been taken by different state Governments since 2000. But they are not fully implemented, on a country level. Most of the time we lack in computer literacy, computer related resources and infrastructure. Till date, still 70% of India resides in rural area and that constitute a large population. Though various services have been initiated by Central and State Government, nothing can be declared as complete success. So with the advance in technology we should try to transform these services to the cloud as it will be helpful in utilizing a large number of resources. India is a land of diversity. Every place constitute of different kind of needs and related service. Also the population varies from one state to another. So maintaining different

aspect at every level is a tough job. But with the help of cloud we can achieve it more easily than any other process.

### II. RELATED WORK

In a paper titled '*Emerging e-Governance Opportunities for CDAC*' [6] the authors have stated that E-governance is very much necessary in order to improve the image of the Indian Government. E-governance will increase the effectiveness and efficiency of the Government. The implementation of e-governance will help to reduce the up-front cost. The benefit of electronic governance can be seen in various areas such as the Indian Railways reservation system which is the most successful example for this scenario. If the Government needs transformation, it should implement such modern technologies as the officials who are looking forward for development are emphasizing on the need of the spread of information technology in every sphere. The load of paper work which is a major factor for delay in searching for any record and also accumulation of huge heaps of files those are stored here and there. Making the system online will help in reducing these things a lot. The applications used in the different enterprises are another emerging field which has been keenly looked upon by the Government organizations. The services are now dealt with cost optimization and a value is added to them as well.

The characteristics [7] of cloud computing includes on demand self-services, which will make available some services that will reduce human interaction between consumer and the service provider; Resource Pooling which will help in dealing with multiple consumers by engaging multiple resources; Mutitenacity, a term synonymous to the need of policies, their enforcement, governance and service levels etc. Measured Service the resource related to cloud computing can be measured leaving the consumer with a transparent system for availability and delivery of services.

Cloud computing can also be used to mitigate the problems of infrastructure mostly faced by the rural areas. There are

three modes in which cloud computing can be utilized to facilitate the implementation of e-governance in rural areas. The first one is the use of Infrastructure as a service in which the access shall be done by nodes using simple devices such as simple PDAs like tablets etc. The other model deals with platform as a service in which different kinds of services are provided by such as the operating system, integration systems etc. the third model deals with the use of software applications as a service like the tax-filing system, employee management system etc.[8]

Previously, K.B.C Saxena has discussed the concept of e-governance. The aim of his paper was to explore the necessary attributes of a governance-centric initiative under the banner “*excellent e-governance*” (e2-governance), and he described a methodology for ensuring such excellence in e-governance implementations [14]. Gurmeet Singh and RD Pathak, RafiaNaz and RakeshBelwal threw some light on the scenario of e-governance in countries viz. India, Ethiopia and Fiji. The conclusion from their survey is that E-governance can also helps in cutting down the corruption. Also the service quality can be improved [15]. Claudio Ciborra interpreted e-government and development with the major focus on e-governance, efficiency and transparency. Taking Jordan in consideration, Claudio demonstrates how e-government is difficult to implement, given the characteristics of the local administration, the socio-economic context and the dynamics of the technological infrastructure [16]. Hong-Linh Truong, Schahram Dustdar did a survey on cloud based sustainability governance system and concluded that Cloud computing emerges as a potential candidate for supporting sustainability governance [17]. Azeem Aleem, Christopher Ryan Sprott did an analysis of benefit and risk assessment of cloud platform under their model. The survey analysis highlighted that the top concerns for organizations on cloud were security (93.8 per cent), governance (61.1 per cent) and a lack of control over service availability (56.6 per cent) [18].

The scope of E-Governance in India has been discussed along with its scope that include Government to Citizen, Consumer to Government, Government to Government, Government to Business and Government to NGOs. The different strategies for E-Governance implementation were also discussed in which building E-Governance awareness and commitment, strategic and implementation capacity, infrastructure for E-Governance implementation have also been discussed. [9]

In 2003, a framework for E-Governance was proposed which focused on the interaction between two entities, i.e. Government and its citizens. In their model, they discussed the managerial, participative and consultative modes. [5]

But no work has been so far for proposing a model in order to focus the implementation of cloud computing in rural areas. Therefore, this paper is focusing on the need of such model and what should its architecture be.

**III. E-GOVERNANCE IN INDIA**

The scope and need of E-Governance in India is increasing along with the numbers of users and services. Government bodies are keen to provide as much as services possible.

Through E-Governance both time and resources are utilized at a rapid pace. IRCTC and Indian Passport authority is the best example of India’s E-Governance success. Now in several other sectors like in issuing driving license, filing income tax returns etc, electronic medium are getting utilized by the government on a country wide level. But then also there are several services that are provided on a singular basis by a single state or even by a district only.

Table 3.1: E-governance services in India

State/Union Territory	Initiatives Taken By The Government In Different Areas
Andhra Pradesh	Online Mphs Multi-Purpose House Hold Survey, Online Cfst, E-Seva, Online Post Matric Scholarship, Online Complaint Registration, Online Application Facility For It Industry, E-Filing Of Commercial Taxes, Complaint Redressal System, Employee Information System (Eim), Prajavani (Ap).
Arunachal Pradesh	Community Information Centers (Cics), Online Bus Schedule Services, Online Telephone Directory, Application Forms.
Assam	Electoral Rolls, Bpl List, Passport Computerization System, National Register Of Citizenship (Nrc), Computerized Land Records System, Prithvi Geographical Information System (Gis), Udyog Ratna, Vidhan Magistracy Case Management System, Shapath Affidavits Management System, Jana-Sewa Computerized Public Services Facilitation Counter System, Parishodh Computerized Bakijai (Loan Repayment) System, Nathi-Awasthiti Computerized File Monitoring System, Anushrawan Computerized Circle Office To Dc Office Monthly Reporting System, Manab-Sampad Computerized Personnel Information Management System, Griha-Lakshmi Computerized Public Distribution System (Pds), Baton Computerized Payroll System, Abhiyog Computerized Public Grievance System, Gramunnayan Computerized Drda Schemes Monitoring System, Dak Mail Management Application, Online Tender Information,
Bihar	Online Grievance Registration, Jankari, Online Enrollment In Electoral Roll, Online Electricity Bill Payment, E-Gazette, Information And Public Relations Department, Website Directory, Government Tender.
Chhattisgarh	Online Lands Records, Public Utility Forms, Online Grievance Redressal, Jan Bhagidari, Online Electoral Rolls, Choice, Online Government Notification, E-Mail Directory, E-Challan.
Goa	Computer Literacy Program (Clp), Cyberage Scheme, Single Official Portal, State Data Centre, Common Service Centers (Cscs),
Gujarat	Mahitishakti, Online Application Forms, Government Resolutions (Gr) Book Online, Gujarat Bank Of Wisdom, Online Registration With Employment Exchange, E-City (Amc), Jan Seva Kendra, E-Dhara, Registration Of Documents, Swagat, E-Gram Viswa Gram Project.
Haryana	Online Land Records, Online Examination Result, Online Admission Notice, Online Judicial Services, Public Utility Forms And Procedures, Online Citizen’s Charters, Online Collector Rate, Department Of Employment, Government Notification, Online Web Directory, Transport Services.
Himachal Pradesh	Sugam, Pensioner’s Helpline, E-Salary, E-Rozgar, Cause List Of District Courts, Case Status Of High Court Of Himachal Pradesh, Online Registration Of Electors, Online Electricity Bill Payment, Online Judicial Services, E-Salary, Online Hotel Registration, Website Directory, Online Tenders, Online Blood Donor List, Online Pensioner’s Helpline, Hp Police Web Portal, Egazette, Employment News,

	Examination Result, Online Bus Ticket Booking, Online Electoral Rolls, Write To Chief Minister, Sugam, E-Samadhan.
Jammu And Kashmir	Community Information Centre – Cic, Online Employment Exchange Information, Online Motor Vehicle Information, and Information Related To The Forms And Procedures.
Jharkhand	Grievance Redressal, E-Nibandhan, Online Land Records, E-Nagrik Seva, Common Service Centre, Government Tenders, Jharkhand Village Profile, Gyanshila, Online Gpf Account, Sms Alert For Gpf Contribution.
Karnataka	Bhoomi, Samanya Mahiti, E-Granthalaya, Sahakara Darpana, Sarathi and Vahan, Returns Filing System (Rfs), E-Man, Aasthi Terige (Property Tax), Child Labour Eradication Activities Information System (Cleais), Krishi Marata Vahini, Ahara, Audit Monitoring System (Ams), Online Text Books For Class X, Raita Mitra, Cascet – 2003, E-Archive.
Kerela	Akshaya, Online Job Registration, E-Mail To Cm and Minister, Online Gis Of Kerala, Online Motor Vehicle Services, Online Civil Supplies Department, Bhurekha, Friends.
Madhya Pradesh	Government Orders And Acts, Online Voter List, Online Pension Calculator, Online Text Book, High Court Judgment And Orders, Online Grievance Redressal, Public Utility Forms, Cause List Of Mp High Court, Daily Mandi Rate, Online Land Records, Tele Samadhan, Online Employment Exchange, Transport Services, Child Record Information System, Citizen Charters, Gyandoot.
Maharashtra	Rojgar wahini, Sarita, Digital Payment System, Setu, Pravara Village It Project (Pragati).
Manipur	Online Government Notification, Online Employment Exchange, Online E-Mail Id, Online Exam Result, Online High Court Judgment, Public Representatives, Transport Services, Social Welfare Department, Minority And Obc Department, Health Services, Electoral Roll.
Meghalaya	Megvat, Online Agriculture Market Price, District Court: Online Cause List And Judgments, Online Name Search In Electoral Roll, Election Application Forms, Online Public Utility Forms, Community Information Centre.
Mizoram	Electoral Rolls, Telephone Directory, Mizoram Gazette, Transport Services, Tender Notice.
Nagaland	Online Government Orders, Online Public Utility Forms, Online Voter List.
Orissa	Bhulekh, Downloads Forms Website, E-Shishu, Itims, Oris, E-Gram, E-Literacy.
Punjab	Punjab Sewa, Suwidha, Online Public Utility Forms, Online Grievance Cell, Land Records Management System, Saarthi And Vahan, E-District.
Rajasthan	E-Mitra, Rajstamps, Send Your Queries To Chief Minister, Online Bpl List, Online Citizen Charter, Online Electoral Rolls, Common Service Centre Scheme, Government Tenders, Rajasthan Police, Acts And Policies.
Sikkim	Online Public Utility Forms, Online Medical Database, Online Voter List.
Tamil Nadu	Employment Online, Public Utility Forms, Anytime/Anywhere Transport Services, Online Land Records, Online Text Books, Grievance Redressal, Cause List Of Madras High Court, Online Electoral Roll, Online Citizen Charters, Electricity Tariff Calculator, Tender Notice.
Tripura	Public Utility Forms, Hospital Management System, Agartala Municipal Corporation, Online Cause Lists, Online Name Search In Electoral Rolls, Online Blood Donor Information System, Examination Result, Transport Information System, Health Service Booking System, E-Suvidha.
Uttarakhand	Online Examination Results, Online Government

	Notification, Online Employment News, Online Application Forms, Online Market Information, Online Weather Information, Dev Bhoomi.
Uttar Pradesh	Court Case Information System, Koshwani, Bhulekh- Up, E-Scholarship, Online Transport Services, Niyukti Online Seva, Gis Based Planning Atlas, Lokvani.
West Bengal	West Bengal State Wide Area Network (WbSwan), Tele Medicine, Smart Card, Kolkata Police Intranet and Computer Network, Braille – Aids.
Andaman And Nicobar	Swan, Sdc, Ssdg, Sp, Negp Projects.
Chandigarh	E-Jan Sampark, E-Sampark, Gram Sampark - Rural Knowledge Centre, M-Sampark.
Dadra And Nagar Haveli	Swan, Sdc, Ssdg, Sp, Negp Projects.
Daman And Diu	Swan, Sdc, Ssdg, Sp, Negp Projects.
Delhi	Grievance Redressal, Public Utility Forms, Employment Exchange, Transport Services, Application Status Finder, Tender Notice.
Lakshadweep	Web-Enabled Ship Ticketing System, Accounts Monitoring Information System, Pay Roll And Gpf Management Information System, Land Acquisition Information System, Land Records Management Information System, E-Mpeda, Web-Enabled Ship Ticketing System, E-Mpeda (Integrated Package For Marine Products Export Development Authority).
Pondicherry	Common Service Centre (Csc), State Service Delivery Gateway And State Portal (SsdgandSp)

This table shows the current situation of e-governance services running in various states [1] and Union Territories [2] as in 2012. We need to overcome all these issues in order to achieve a complete E- Governance. We have to provide it through platforms like cloud so that these services can be delivered to each and every citizen in India.

#### IV. SCOPE OF E-GOVERNANCE IN INDIA [4]

In India, scope of E-Governance can be described on following communication links:

##### A. Government to Citizen (G2C):

It includes all the basic services provided by the government to its citizen. The services are:-

- E-Identity- Identity services like Ration Card, Voter ID Card, Adhar Card, Birth and Death Certificates etc which gives the citizen of India, a proof for its identity can be delivered through electronic medium.
- E-Transport- Transportation services can also be governed by the means of internet. Services like issue of permit, registration of vehicles, road taxes, fees, fine etc can be collected and issued over the net.
- E-Health- Health sector can also be controlled via internet. All the government hospitals can be interconnected for better health management.
- E-Education- There are various government portals which are combined in a way to provide better education at different level. Various other programs launched by the government can be easily informed to the people through it.

The most important aspect of G2C is as follows

- a. Information can be easily distributed among one and all. The clarity in information will also be increased.
- b. Citizen can provide feedback and suggestion. With the help electronic medium any one can file their complaints or get solution for their queries.

With the help of feedbacks and suggestion, government can improve their services.

**B. Citizen to Government (C2G):**

C2G basically deals with E-Democracy. E-Democracy is used basically for the involvement of the citizen in democracy. It also includes awareness regarding government policies, their representatives, getting inputs from citizen. Chat with the citizen, which is also referred as E-Debate in case of E-Governance also provides a medium between the citizen and their elected representatives to interact.

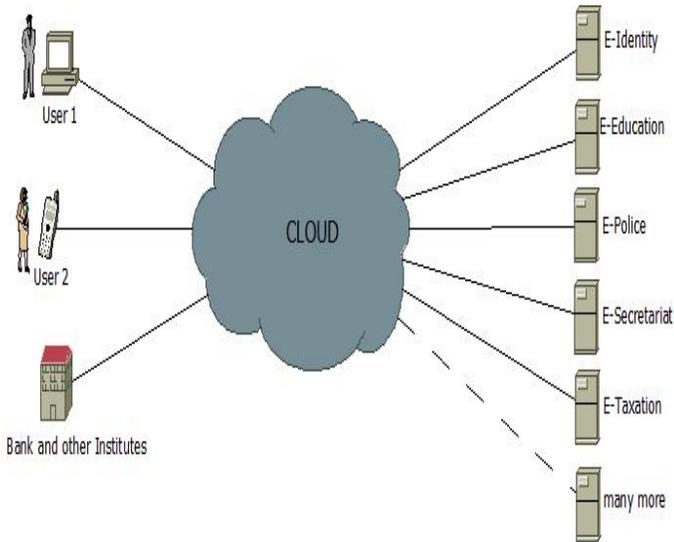


Figure 3.1: E-governance through cloud architecture

**C. Government to Government (G2G):**

G2G is all about those services that Government provides to its sub-ordinate bodies. Basically it deals with all the administrative service. Therefore it is also called as E-Administration. The main services under G2G are

- a. E-Secretariat- Connecting the central or state secretariat with electronic medium is called E-Secretariat. Secretariat holds all the power and valuable information regarding the state. It also provide a kind of cross linkage platform or junction sort of structure for various services to meet at a point.
- b. E-Police- It will help people to file complaints online and check their status as a G2C service. Also for administrative service the records of police department and criminal can be created and managed more effectively with the help of networking database.
- c. E-Court- Again a service which can be termed both as G2C and G2G. In G2C people can check their status of application to the court. They can also find various kind of document related to land etc, through

online. In G2G service database for cases, forensics report can be handled much easily through computers. Also cases can be managed through database and can be prioritized on the basis of severity of case. Online hearing can be done in distant cases. Paper work will get reduced with the advent of electronic gadgets which will further speed up the proceedings.

G2G will have following advantages:-

- a. It will cut down the expenditure heavily which was spent because of delayed proceedings.
- b. Much better administration can be served.
- c. Government can plan, manage and control the activities in subordinating bodies much efficiently.

Much more effective decision making would come in power

**D. Government to Business (G2B):**

G2B mainly concerns for E-Taxation, where the corporate bodies will request for specific permission regarding projects or tenders and other kind of requests..

**V. ISSUES OF E-GOVERNANCE IN INDIA**

There are various issues which a nation and its government have to come across in order to achieve E-Governance successfully, especially in country like India. Some of the major concerns for India in E-Governance are as follows:-

- a. Computer Literacy- The basic and most severe problem in case of India is computer literacy which is around 6-7 percent only. So to use the services of government, majority of the people will lag behind. Also to literate remaining people is a tedious job.
- b. Infrastructure- Providing E-Governance to more than 1.2 billion people require heavy infrastructure. It requires a large number of system, computer and network resources, large database etc.
- c. Capital- To provide this huge infrastructure a big capital investment is required. Private investment may seek unwanted advantage through government. So to build such a huge a capital on own is a big task. Also at the citizen level, according to the survey in 2012, average per day income of an Indian is around \$3.3, in which it's impossible that the average Indian can afford extra expenditure of computer system and internet connection.
- d. Management- Managing all the resources and later the changes in the infrastructure is a difficult to carry out.
- e. Information Security- Privacy, authentication and accountability of the data provided through E-Governance is required. E-Governance holds lots of personal sensitive data of their citizen which needs to be protected.
- f. Services Delivery- The major concern after implementation is of service delivery. The services implemented through E-Governance should reach to each and every citizen of country. In case of India,

mainly in rural sector there are various hindrance like Scarcity of electricity, low bandwidth etc. Cloud is the major solution for most of the issue, as cloud will provide resource utilization, easy management, more security.

### VI. CLOUD COMPUTING

Cloud Computing is used as a ubiquitous model to access shared pool of computer resources over the network. Computer resources include networks, servers, storages etc. Cloud computing basically works on remote access by the client. [10]

In case of E-Governance, Cloud computing helps the government by cost saving whereas for citizens it provides much more interactive and accessible content online.

Cloud computing is classified in various forms of services. They are as follows:-

- a. Infrastructure as a service
- b. Platform as a service
- c. Software as a service
- d. Network as a service
- e. Storage as a service
- f. Security as a service
- g. Data as a service

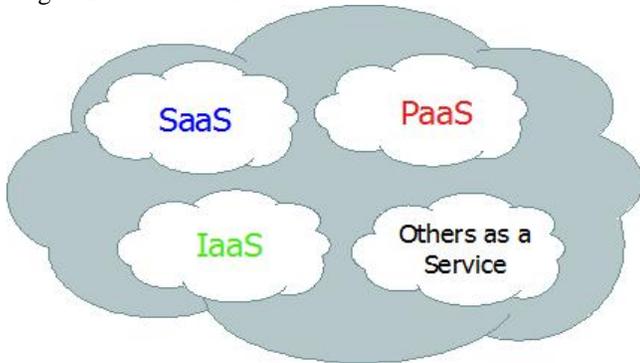


Figure 4.1 Various services provide by cloud

Many more classification have been done according to the growing trends but still only the first three are considered as the basic kind of services by the service providers.

In E- Governance at present, we need only two of the three basic services. They are

- a. Infrastructure as a Service (IaaS) –It include virtual machine, operating systems and other hardware appliances. There is an Application Programming Interface (API) to manage the resources. Example of IaaS providers are Amazon EC2 etc.
- b. Platform as a Service (PaaS) - PaaS offers new solution stack for software management. It includes Runtime environment and lifecycle management component. Example Google Apps etc.

Cloud can be deployed though following models:-

- a. Private Cloud – Accessible only to a private network.
- b. Public Cloud – Accessible to everyone.
- c. Community Cloud – Accessible to a specific community or shared for some specific concern.
- d. Hybrid Cloud – A composition of two or more cloud.

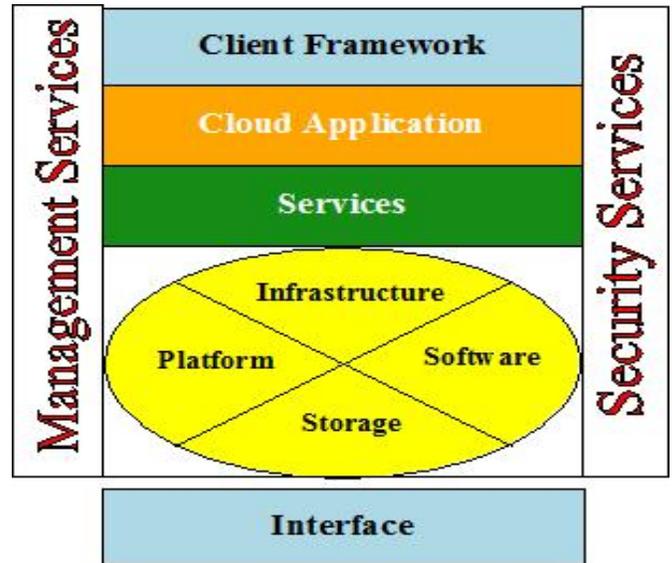


Figure4.2:Cloud architecture

### VII. MODEL TO DEPLOY E-GOVERNANCE THROUGH CLOUD

When we talk about E-Governance through cloud computing, we basically talk about collaborative government. In collaborative government, government decides degree of public participation and consultation. So taking collaborative governance in consideration we will discuss the four pillars of our model, which will help us to deploy the model even at the grass root sector of the country.

#### A. Four Pillar Of Model:

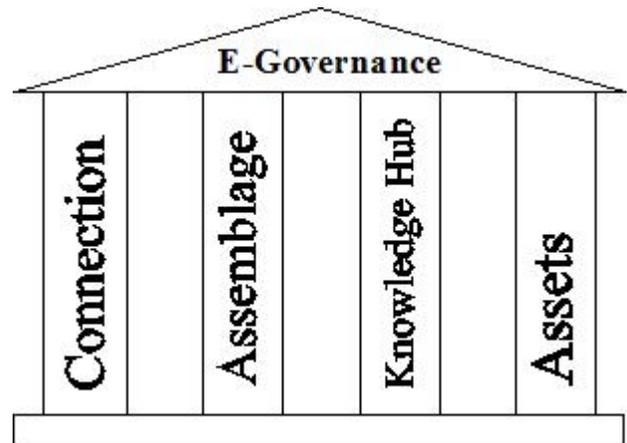


Figure 5.1: Pillars of E-governance through cloud computing [3]

So the four parameters we are taking as pillars are:-

- a. **Connectivity-** Connecting the citizen through the cloud services is necessary so that E-Governance can be served. Providing connectivity in urban area is not a difficult task but at rural level it's a greater hindrance in term of E-Governance's success. For this we can create a support desk system in every gram panchayat, somewhat like in Gyandoot Yojna,[11] in Dhar, Madhya Pradesh. These support

desk systems will be installed with computer system connected through internet. Now it depend upon local development whether it is connected through broadband, dial up connection, Wi-Fi or through any other medium. Computer literate youth can be selected or may be trained according to the population of the village. They can serve various kinds of services on behalf of the villagers on request. For example, they can check out their revenue through E-portal and if possible can be pay there as well. It will help both villagers and government. Many such services can be served through these service desks. These service desks can save the cost of extra expenditure of system and internet connection for rural people. And then educating 5-10 people is easy in comparison to educating a whole village. Also it will provide many other advantages like, job for some unemployed youth, regular and timely payment of revenues etc.

**b. Assemblage-** Assemblage deals with the content of the data to be provided. As India is land of diversified culture and various languages. There are different kind of needs and service delivery medium. Most importantly the portal of different areas, more specifically in a particular state, should be designed in the local language defining the local need. May be in a place like Uttar Pradesh where sugarcane is grown in large quantities and its payment are overdue for a long period can be served with a portal specifically for this service. The people can check there account and request for payment of due amount from their place only instead of going to distantly built sugar mills. It will provide a fast access of service for both farmers and governments. In the similar manner portal for different areas can be developed according to the need and culture of the area.

**c. Knowledge Hub-** Knowledge Hub mainly constitute of the cloud and other resources utilized in the E-Governance. We will discuss regarding cloud in later section of the paper. Other resources include what data to be stored in the cloud, how the data will be segregated, what is the other technical and functional aspect will be required in maintaining the platform to serve the request of the citizens. In simple word knowledge hub will maintain records of all the data to be stored. But before storing a well thought policies should be considered. As there are certain issues regarding cloud securities which will also discuss in last sections. So risk consideration should be decided before storing and processing the data on cloud.

**d. Assets-** Assets means capital needed to develop the entire E-Governance platform. We can't implement all the E-Governance facility at once, because of following reasons:-

- i. We don't have accurate information of all the records related to a particular service. Therefore we can't allocate definite amount of storage capacity at once.

- ii. There may be a need of segregation between the data to be processed and data to be stored.
- iii. Prioritizing services according to the regions and allocating resources accordingly.

As cloud storage needs huge amount of money which should not sponsored by private organization, as we discussed earlier. It needs to collect capital in form of some revenues generated by E-Governance.

**B. Development Of Model:**

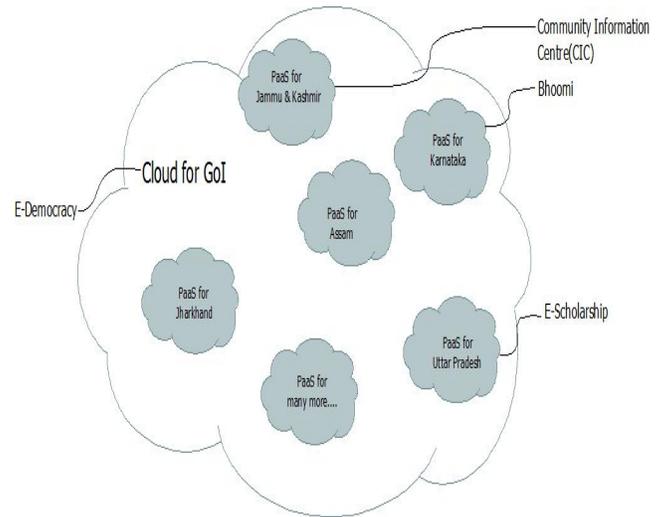


Figure 5.2: Existence of E-governance services in a cloud

In the main model PaaS for cloud we would use two forms of cloud services will be deployed.

The first one will be the main cloud which is a public cloud. It will be owned by Government of India (GoI). GoI will use this cloud as IaaS. They will make the adequate segregation of resources of cloud and will provide an individual PaaS to almost each state, where states can develop their own services according to the need of the area. While GoI can access any data from anywhere, the other state are only able to access their own data. They will access the other's state data as a normal citizen only. They can't make changes in other's developing application or program.

Though GoI provides platform to other state, there are various central program which will be served by GoI only like E-Transport, E-Identity etc. For these services they can allocate a section of cloud for themselves and it will be independent from the states.

The government service will work on the basis of scope defined. The data request will be segregated just after the request is made and will be served under the specific scope. Most of the time the users will be citizen, he/she will access the data, and some time he/she may request for creation of new data also. On the other hand if user is governing body, it may bring some changes in the data, as per the requirement. Mostly in the case of G2B, the third party will get involved at a larger scale, as G2B basically deals with tender request, allotment, taxation etc. The third will be involved only in G2B/B2G. The basic functioning of the E-Governance is shown in the flow chart below.

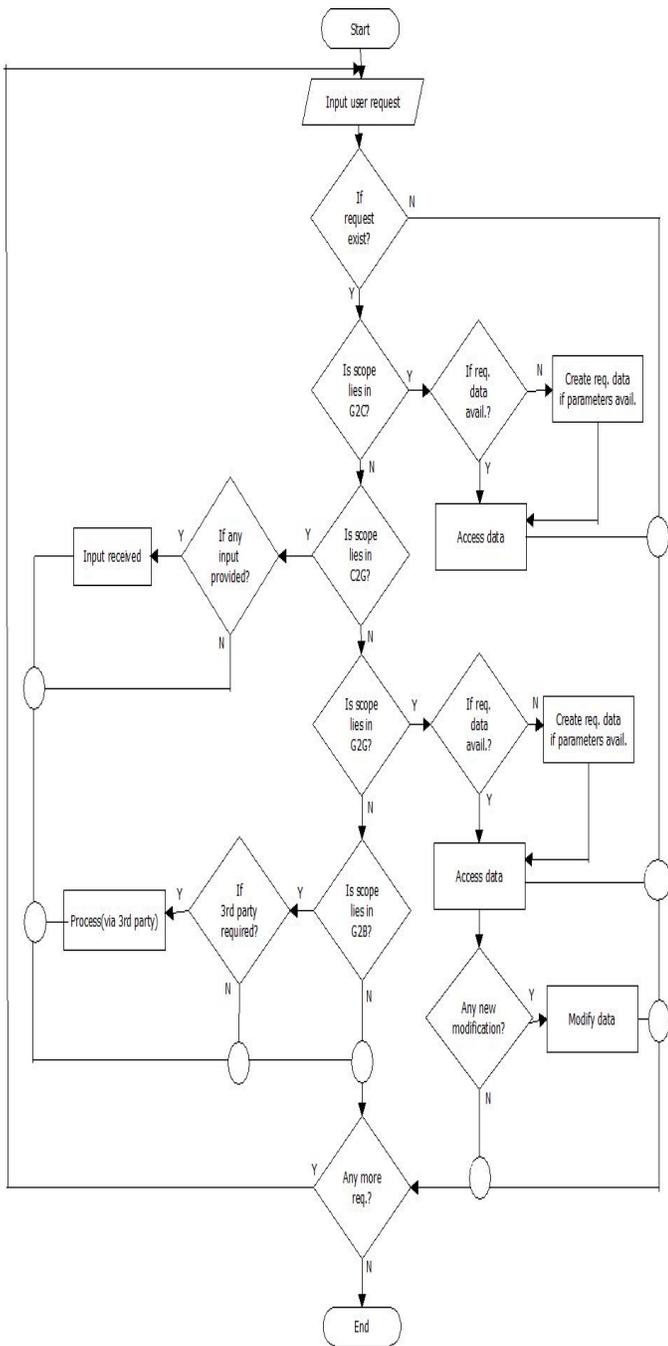


Figure 5.3: Flow of services in E-governance

### VIII. CLOUD SECURITY ISSUES

There are various kinds of security threats related to Cloud Computing, but in the context of E-Governance, the most important aspect is Privacy. There are some principles regarding privacy should be follows:-

- a. Data should be collected in a limited manner with the consent of data subject.
- b. Data quality should be maintained by keeping data accurate and relevant.
- c. Sensitive Personal Data should be protected by the reasonable degree of security.

- d. An individual should be able to obtain the details of information about them held by the data controller and challenge it if incorrect.

The other issues regarding cloud securities are:-

- a. Control over infrastructure
- b. Intransparent data location
- c. Unauthorized access
- d. Destruction or modification of data
- e. Unauthorized use of data
- f. Insecure API's
- g. Misuse of administrator's right

### IX. SECURITY APPROACH

There are various security approaches present for cloud computing but we can't use most of them with E-Governance, like we can't provide access control. It is because it will not provide all the desired information to each and every citizen. We can't go for strong encryption standards because again it will become a hurdle for availability of information. So it becomes very hard to deploy any security model in this case.

But to some extent we can provide adaptive security approach where we can limit the users with certain bandwidth and pool of IP-Address, so that user which exceeds that limit can't access data.

The main advantage of this model is that, we can prevent the foreign invasion on our country's data. As all the data is public and any one can excess it, there is a chance that some people may use it for criminal intention or to gain access about the country or state in order to create terrorism like activities. So with this model we can prevent such activities up to certain extent.

Talking about disadvantages, this model will also prevent an individual to access his own data from remote location. Individual can only access his data from his home location only.

### X. FUTURE WORK

Future work will include:-

- a. There should be a proper Research and development of an appropriate model which can address security issues in case of E-Governance.
- b. On the other hand there need to be programs on practical level to increase the computer literacy of the citizens of country.
- c. There should be program to increase the connectivity of the remote areas with proper bandwidth and internet speed.

### XI. CONCLUSION

Hence we have seen that to provide better and effective governance, E-Governance is the best approach. Further for resource utilization and cost saving to provide E-Governance, Cloud Computing is the best practice present at this time. We can provide all the services to the remote and rural area through our model. We have some securities issues for which we have to come up with an appropriate solution

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