

# Trusted E-Governance Based Application through cloud computing

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**Abstract—** In existing system in government organizations it is very difficult to exchange information between the different sub organizations. For instance data from election commission cannot be easily shared with the Police. When a situation arises, it has to go through levels of bureaucracy and authorization and lot paperwork has to be done to finally get the required information which wastes huge amount of resources and time. The objective of the thesis is to show the importance of cloud computing and the benefits that can be availed by Indian Citizens as well as Government. For instance if a traffic police wants to know personal information of a driver, he will just provide registration number of the driver and his personal information will be forwarded from the MORTH and election commission to the police officer. Here, we have implementing and solving a specific model problem to implement effective e-governance. The objective is to achieve this with cloud computing.

**Keywords—** Cloud Computing, E-Governance, Web Application, Cloud Service Model, Deployment model, Google App Engine, Cloud migration strategy.

## I. INTRODUCTION

This Cloud Computing refers to applications and services delivered through the Internet. These services are provided by Data Centers all over the world and hence referred as "cloud." A user with the help of an Internet connection can access the cloud and the services it provides. Since these services are often connected, users can share information between multiple systems and with other users.

We can store any kind of data that we use in our day to day life from simple photographs, favourite songs, or even save movies to huge bulk amounts of data which is confidential. Cloud is a pool of computing service on large scale. The increasing network bandwidth and reliable yet flexible network connections make it even possible that users can now subscribe high quality services from data and software that reside solely on remote Data Centers. The Cloud helps enterprises to have a dynamically scalable abstracted computing infrastructure that is available on-demand and on a pay-per-use basis.

Client computing service providers are providing on demand services & other related IT management services.

Cloud computing offers the various service to various Government and non-government organizations. Thus, incurred the overall industry expenses and benefit the entire world directly. The cloud computing services are beneficial for the small industry setup. Moreover, it enhances the quality of service.

E-Governance is an interface between Government and public or this can be an interface between two governments or between government and business organizations-governance application of traffic management. This application solves the problem to identify the personal details of the citizen throughout the India. Moreover, this application helps the police to verify the fake driving license and the other details associated with it.

## II. SERVICE MODELS

Cloud computing can be classified by the model of service it offers into one of three different groups or three different stacks. These will be described using the XaaS taxonomy, first used by Scott Maxwell in 2006, where "X" is Software, Platform, or Infrastructure, and the final "S" is for Service.

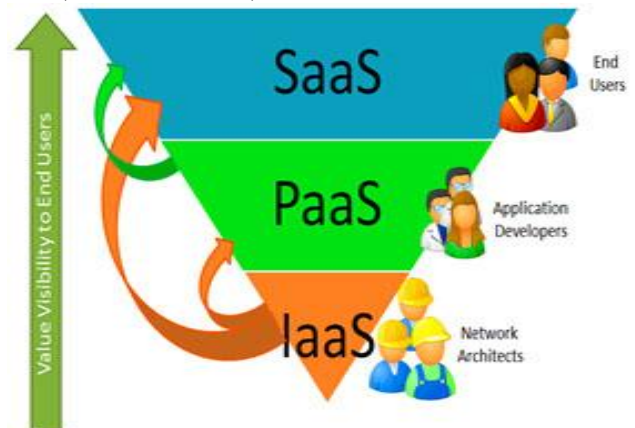


Fig. 1 Cloud computing service model

### A. Hardware as a Service (HaaS)

HaaS is sometimes also called Infrastructure as a Service (IaaS). Hardware as a Service (HaaS) is the next form of service available in cloud computing. Where SaaS and PaaS are providing applications to customers, HaaS doesn't. It

simply offers the hardware so that your organization can put whatever they want onto it.

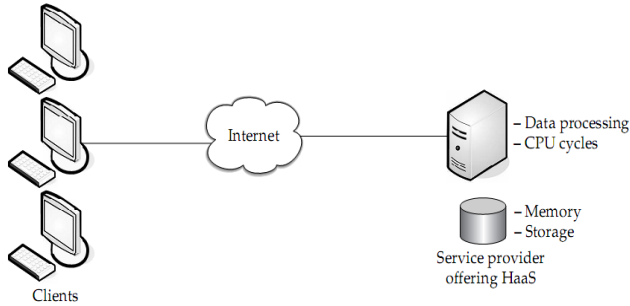


Fig. 2 HaaS allows service providers to rent hardware resources

Rather than purchase servers, software, racks, and having to pay for the datacenter space for them, the service provider rents those resources. HaaS allows you to “rent” such resources as: Server space, Network equipment, Memory, CPU cycles, Storage space.

### B. Platform as a Service (PaaS)

PaaS is also known as cloudware. Platform as a Service (PaaS) is another application delivery model. PaaS supplies all the resources required to build applications and services completely from the Internet, without having to download or install software.

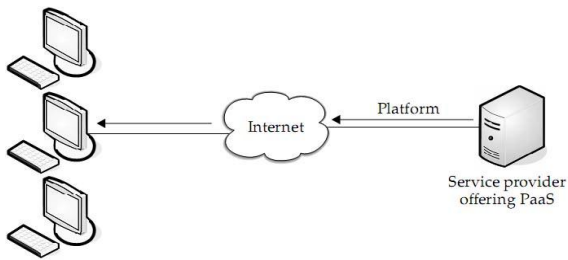


Fig. 3 PaaS allows clients to access a computing platform over a cloud computing solution

### C. Software as a Service (SaaS)

Software as a Service (SaaS) is the model in which an application is hosted as a service to customers who access it via the Internet.

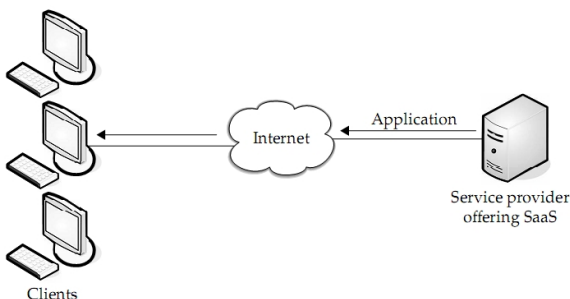


Fig. 4 SaaS provides an application or piece of software from the service provider

## III. DEPLOYMENT MODELS

Clouds can also be classified based upon the underlying infrastructure deployment model as Public, Private, Community, or Hybrid clouds.

*Public clouds:* - A public cloud’s physical infrastructure is owned by a cloud service provider. Such a cloud runs applications from different customers who share this infrastructure and pay for their resource utilization on a utility computing basis.

*Private clouds:* - A private cloud might be owned by the customer, but built, installed, and managed by a third party rather than the customer. The physical servers might be located at the customer’s premises or sited in a collocation facility.

*Community clouds:* - When several customers have similar requirements, they can share an infrastructure and might share the configuration and management of the cloud. This management might be done by themselves or by third parties.

*Hybrid clouds:* - Finally, any composition of clouds, be they private or public, could form a hybrid cloud and be managed a single entity, provided that there is sufficient commonality between the standards used by the constituent clouds.

## IV. CLOUD MIGRATION STRATEGY

Typically migration initiatives into the cloud are implemented in phases or in stages. A structured and process-oriented approach to migration into a cloud has several advantages of capturing within itself the best practices of many migration projects. While migration has been a difficult and vague subject—of not much interest to the academics and left to the industry practitioners—not many efforts across the industry have been put in to consolidate what has been found to be both a top revenue earner and a long standing customer pain. The Six-Step Model of Migration into the Cloud as part of our efforts in understanding and leveraging the cloud computing service offerings in the enterprise context. This six-step Cloud migration Strategy model provides it leaders with a process to assess how cloud computing can fit into their overall it strategy, in support of the mission and overall strategy of their agency, and then take action toward moving to the cloud. The New approach to migrate from Traditional Computing to Cloud Computing is basically based on the Prototyping model of the Software Engineering. The migration from Traditional Computing to Cloud Computing is the continuous improvement process till we attain our goals. The Cloud Migration Strategy model is shown below [1]:

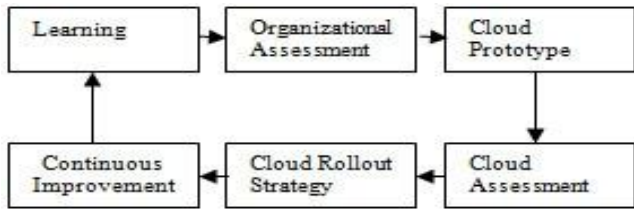


Fig. 5 Cloud Migration Strategy

**Step One:** - Learning: The Cloud migration Strategy begins with learning about the basics of cloud computing—through attending seminars, networking, talking with vendors, and reading.

**Step Two:** - Organizational Assessment: In the second step the IT officers or Government officials should conduct an assessment of their present IT needs, structure, and capacity utilization. In a cloud computing environment, the requirement of the resources can be added—or subtracted—based on needs and demand.

**Step Three:** - Cloud Prototype: In the Third step the IT professionals will develop the prototype for cloud computing based on the requirement for the particular project.

**Step Four:** - Cloud Assessment: After the internal assessment and external assessment of the prototype outreach stemming from the prototype effort, IT Professions should then conduct an overall IT cloud assessment to determine if their organization has data and applications that could readily move to a cloud environment, and which type of cloud public/private/hybrid cloud would be suitable or usable for these projects.

**Step Five:** - Cloud Rollout Strategy: At this stage, this is where the cloud goes from being a test effort to become more mainstream in the way the agency manages its data, its operations, and its people. It becomes part of “normal” organizational operations, just as other prior tech innovations (from telephony to fax to the Internet to e-mail and to social media) have become IT tools, used in support of the agency’s IT strategy, and more importantly, its overall strategy.

**Step Six:** - Continuous Improvement: This is the last step and we call it “continuous improvement” tills we get the fully functional cloud computing based system with live data.

**Hybrid clouds:** - Finally, any composition of clouds, be they private or public, could form a hybrid cloud and be managed a single entity, provided that there is sufficient commonality between the standards used by the constituent clouds.

## V. IMPLEMENTATION OF E-GOVERNANCE THROUGH CLOUD COMPUTING

To apply our proposed approach, we need to develop an application on cloud computing platform. In this part, we carefully analyze the entire cloud platform to deploy our

application. Moreover, we discuss about the problem and its optimized solution with cloud computing technology.

For instance, A Traffic police wants to verify the driver’s license number including all other information like car registration details. He has to send a request to the police control center to execute the query. The police control center will further send a request to the MORTH (Ministry of Road Transport & Highways, Government of India) through the concerning states` DTO. From the MORTH he can know about the licenses number and car registration number. From the Election commission database he is going to get other information about the driver’s instantly. Therefore, in a present system due to lack of e-governance a lot of time is wasted to verify the results. The main reason is due to the sub divisions in many departments.

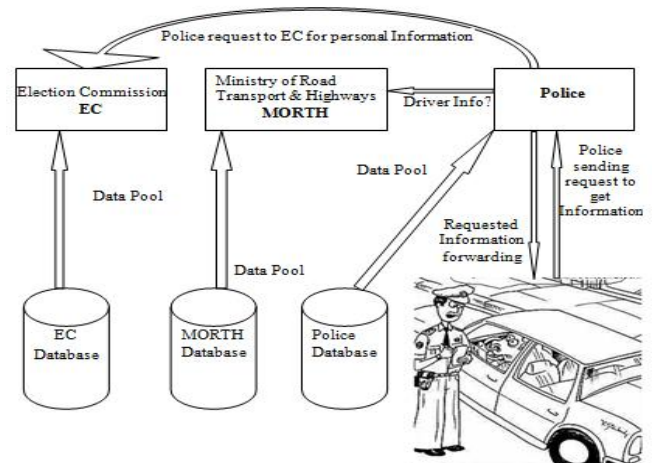


Fig. 6 Present sub divisions make a query results long

Applying web portal through cloud computing, in which the user has final control over the visual presentation and user interaction. As the cloud maintains a central data center (in case of Google apps cloud is maintain a key value mapping database name BigTable) where it store data centrally in a data center and update the data from the remote or local servers by maintaining scheduler. We don’t even need a local server machine to deploy a database and service application. Moreover, the services are accessible anywhere in the world, with the cloud appearing as a single point of access for all the computing needs of consumers.

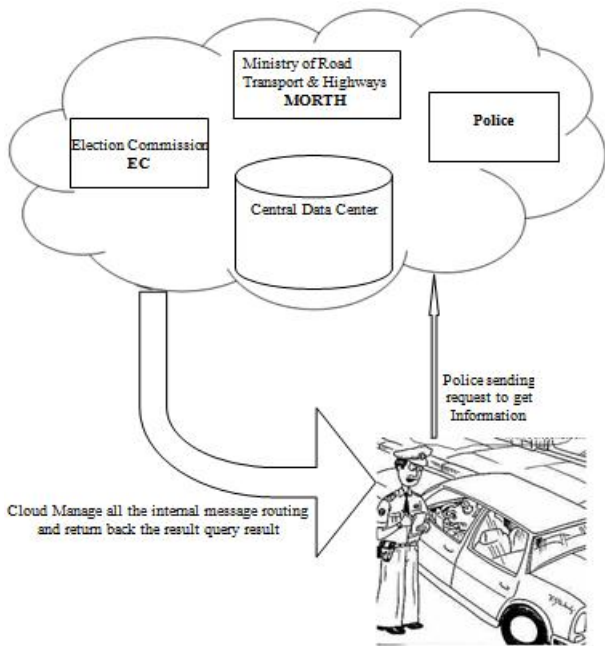


Fig. 7 Cloud Computing makes query results quickly

## VI. RESULTS

In this section we implement and as well as executed the e-governance application using GAE (Google App Engine). We are using standard Java technologies and run them on Google's scalable web application infrastructure.

Google App Engine uses the Java Servlet standard for web applications. App's servlet classes, JavaServer Pages (JSPs), static files and data files, along with the deployment descriptor (the web.xml file) and other configuration files, in a standard WAR directory structure. The JVM runs in a secured "sandbox" environment to isolate your application for service and security. App Engine provides scalable services that apps can use to store persistent data, access resources over the network, and perform other tasks like manipulating image data.

Google App Engine ensure Transparency to their customer. Both ways Google ensure transparency like:

- (1) Software architectural point of view
- (2) Accountable to government

So the end user will never know what is going on inside and will not feel any interruption.

You will have some idea how Google is accountable to governments from the link below:

<http://www.google.com/transparencyreport/governmentrequests/>

Therefore, due to accountability feature in Google App Engine provide us e-governance through cloud for private organizations and government as well until government have its own cloud. Given below is a screenshot of the application designed when run on localhost:

<http://localhost:8888/e-govtindia>



Fig. 8 Application running on local host

As you can see, I am running the application on my local development server and invoke the servlet. The deployed application can be seen on <http://e-govtindia.appspot.com/>

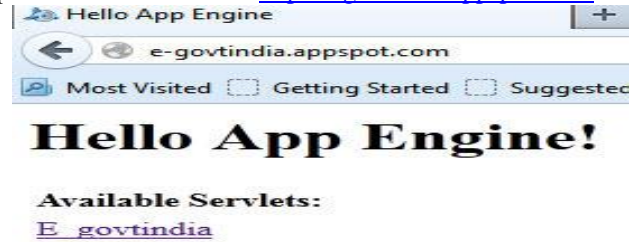


Fig. 9 Application running on cloud computing

Moreover, Google App Engine also provide various system monitoring tools such as database view which is depicted below:

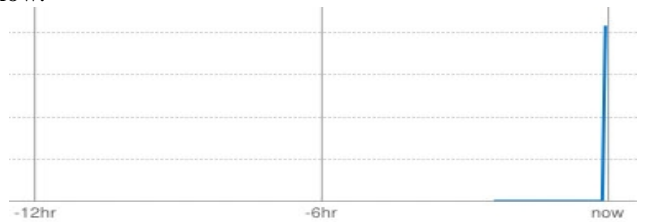


Fig. 10 Present Database view form Google cloud

The main interface of web application when run on local host is shown below:



Fig. 11 service view from the local cloud

The main interface of web application when deployed can be seen on [http://e-govtindia.appspot.com/e\\_govtindia](http://e-govtindia.appspot.com/e_govtindia)



Fig. 12 service view from the Google cloud

Moreover Google App Engine also provide us to manage our applications through cloud. Some of the tools are shown below.

- [Instances](#)
- [Logs](#)
- [Versions](#)
- [Backends](#)
- [Cron Jobs](#)
- [Task Queues](#)
- [Quota Details](#)
- [Datastore Indexes](#)
- [Datastore Viewer](#)
- [Datastore Statistics](#)
- [Blob Viewer](#)
- [Prospective Search](#)
- [Text Search](#)
- [Datastore Admin](#)

Fig. 13 My application List to control apps

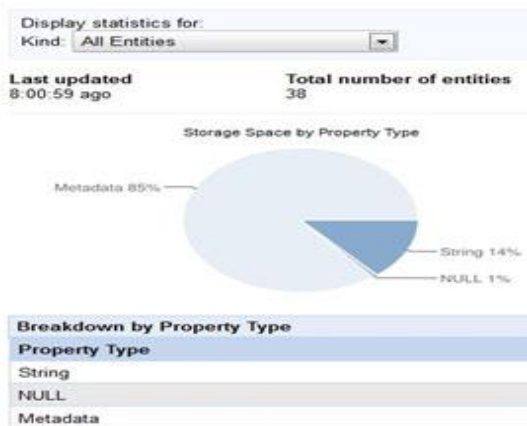


Fig. 14 Database entry management tools

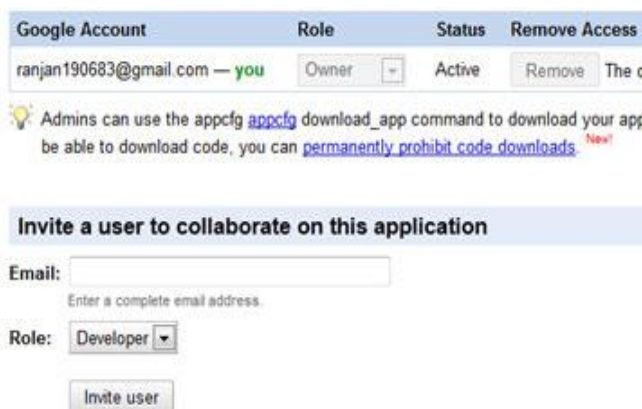


Fig. 15 Application developer permission

## VII. ADVANTAGES OF WEB BASED CLOUD COMPUTING

There are several advantages and are presented below [2]:  
**Price:** - It is easy for the small companies to start-up the business as they do not have to invest huge sums of money into setting up infrastructure such as servers, data servers, database administrators, etc. Instead, enterprise companies pay for services based on usage.

**Simplicity:** - It is simple to use and set up all the services.

**Reliability:** - Cloud computing guarantees reliability as the service providers are experts in maintaining the infrastructure.

**Legality:** - Who owns the enterprise data? Do the service providers also have ownership? Even if non-disclosure agreements are signed, these might be waived when government agencies are involved. This begs the question whether the client might be ready to forgo the rights of their data. As well, issues arise regarding intellectual property rights when data services are hosted by a third party site.

**Mentality:** - For wide acceptance of cloud computing it requires consumers to relinquish the ownership mentality some extent and to develop a somewhat broader mindset. Indeed once service for cloud computing is accepted; it will be hard to go back to older ways.

## VIII. CONCLUSION

The main goal of a well implemented E-government project is to enable citizens, enterprises and organizations to manage their transactions with government more easily, faster and at a lower cost. In this thesis, I discuss the importance of cloud computing in Indian Scenario. The Companies like IBM, HCL, Infosys already started to move to Cloud computing. Even Adobe the largest leading software company moved to cloud migration. The private sector is fastly moving to cloud computing whereas public sector might take time. The advantage of migration to cloud computing is the removal of digital divide between rural and urban areas and benefitting the both areas.

In India the Jammu & Kashmir state government is the first to adopt Cloud computing for its e-governance services. The government, using the State Data Centers based out of Madhya Pradesh, is provisioning e-governance services such as issuing death or birth certificates and trade licenses through the Cloud. It is using Microsoft's solution to implement Cloud computing. The governments of Himachal Pradesh and Uttaranchal are also in discussions with Microsoft to roll out e-Government services based on the Cloud platform.

## IX. REFERENCES

[1] DR.ASHISH RASTOGI, "A MODEL BASED APPROACH TO IMPLEMENT CLOUD COMPUTING E-GOVERNANCE", *IJCA* ISSN: 0975-8887, NOVEMBER, 2010.

[2] LIADHAR R.REWATKAR AND UJWAL A.LANJEWAR, "IMPLEMENTATION OF CLOUD COMPUTING ON WEB APPLICATION", *IJCA* ISSN: 0975-8887, JUNE, 2010.

[3] THE GOOGLE WEBSITE. [ONLINE]. AVAILABLE: [WWW.GOOGLE.CO.IN/](http://WWW.GOOGLE.CO.IN/)

[4] THE TECHTERMS WEBSITE. [ONLINE]. AVAILABLE: [HTTP://WWW.TECHTERMS.COM/DEFINITION/CLOUD\\_COMPUTING/](http://WWW.TECHTERMS.COM/DEFINITION/CLOUD_COMPUTING/)

[5] THE WIKIPEDIA WEBSITE. [ONLINE]. AVAILABLE: [HTTP://EN.WIKIPEDIA.ORG/WIKI/WIKIPEDIA/](http://EN.WIKIPEDIA.ORG/WIKI/WIKIPEDIA/)