

# Cloud Computing and E – Governance

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**Abstract** --- E- Governance offers a large opportunity for serving the citizens in better way. ICT promises lots of advantage in governance process but at the same time requires efforts for changing process, building infrastructures, capacity enhancement etc. The increasing generalization of technology access by citizen and organizations brings expectations and demands on government. At the same time, governments are also proactive in this domain and are planning new ways of interacting, improving services, optimizing processes and revitalizing democracy by spending amount on IT. In this paper, we analyze cloud computing and examines its application in the context of e-government. Existing e-government practices face many challenges, from development to implementation. We propose cloud computing as an ideal solution to these challenges. Cloud computing is the future generation of computing. It entrusts services with a user's data, software and computation over a network. It is a very new concept in the field of computing software, hardware and network. Cloud computing relies on sharing of resources to achieve coherence and economies of scale similar to a utility (like the electricity grid) over a network (typically the Internet). The worldwide revolution in internet is changing our lives in terms of the way we work, learn and interact. These changes naturally should reflect the way government functions in terms of the organization of the government, its relationship with its citizens, institutions and business and cooperation with other governments.

**Index Terms**----cloud computing, entrusts, coherence, development, e-government.



## 1. INTRODUCTION

E-Government is a digital interaction between a government and citizens, government and businesses/commerce, government and employees and also between government and governments/agencies [1]. This digital interaction consists of governance, information and communication technology, business process re-engineering, and e-citizen at all levels of government (city, state/province, national, and international). Through E-Government, the internet and the world-wide-web are used for delivering government information and services to the citizens. The ultimate goal of the E-Government is to increased public services in an efficient and cost effective manner. E-government helps simplify processes and makes access to government information more easily accessible for public sector agencies and citizens. In addition to its simplicity, e-democracy services can reduce costs [2]. The anticipated benefits of e-government include efficiency, improved services, better accessibility of public services, and more transparency and accountability [3].

E-Government allows government transparency because it allows the public to be informed about what

the government is working on as well as the policies they are trying to implement. Simple tasks may be easier to perform through electronic government access. Many changes, such as marital status or address changes can be a long process and take a lot of paper work for citizens. E-government allows these tasks to be performed efficiently with more convenience to individuals. E-government is an easy way for the public to be more involved in political campaigns. It could increase voter awareness, which could lead to an increase in citizen participation in elections. It is convenient and cost-effective for businesses, and the public benefits by getting easy access to the most current information available without having to spend time, energy and money to get it [4].

E-governance refers to governance processes in which information and communications technology (ICT) play an active and significant role for efficient and effective governance, and for making government more accessible and accountable to the citizens. E-Governance has become an integral part of public sector transformation as Information and Communication technology (ICT) have helped to deliver more modern services for citizens and

businesses. It stimulates the emergence of Information Society, drive public sector transformation and help governments prepare for future models of public administrations. ICT in government helps in providing new governance services and products. It enhances participation of people. It also helps in better information dissemination. As ICT has already become an integral part of everyday life. The challenge for the next generation of e-governance applications is to continue to improve public sector performance. The partnership with the various stakeholders for E-Government initiatives can be in many areas such as: Financial Investment, Infrastructure Setup, Solution Architecture and Technology selection, Content Development and Management, Rendering front-end services to the Citizens, roll-out of e-government project, software development, project management and assessment, capacity building etc.

It describes the use of technologies to facilitate the operation of government and the disbursement of government information and services. E-government includes the use of electronics in government as large-scale as the use of telephones and fax machines, as well as surveillance systems, tracking systems such as RFID tags, and even the use of television and radios to provide government-related information and services to the citizens. E-Government enables anyone visiting city website to communicate and interact with city employees via the Internet with graphical user interfaces (GUI), instant-messaging (IM), audio/video presentations, and in any way more sophisticated than a simple email letter to the address provided at the site and to enhance the delivery of government services to benefit citizens, business partners and employees" by using:-

- Information and communication technologies, and particularly the Internet, as a tool to achieve better government.
- Information and communication technologies in all facets of the operations of a government organization.
- Continuous optimization of service delivery, constituency participation and governance by transforming internal and external relationships through technology, the Internet and new media.

## **2. E- GOVERNANCE PPLICATIONS**

The Government is the primary provider of all these

applications, giving its citizens, employees, state owned enterprises and others, access to such applications. E-Governance aims to provide reliable services to all stakeholders, round-the-clock, with acceptable levels of performance. Some of the common E-Governance applications are listed here [5]:

### **2.1 E-PROCUREMENT**

Automation of purchase and sale of supplies and services over the internet for the Government and various governmental bodies.

### **2.2 HRMS**

Government can configure payroll and benefit systems, create and management training systems and even track performance reviews. RMS can eliminate the need for paper work, thus helping the government in its go green initiatives.

### **2.3 E-POLICE**

Providing easy access to information by making queries across databases of police stations across zones and states, for efficient policy. This increases safety mechanisms and helps provide better services too.

### **2.4 E-COURT**

E-Court facilitates integration of different courts, improves scheduling of cases and effective exchange of information between stake holders.

## **3. METHODOLOGY FOR DEVELOPING E-GOVERNANCE APPLICATIONS**

### **3.1 HIGH AVAILABILITY**

Applications deployed are inherently high available without incurring too much on infrastructure costs. This feature is extremely useful in disaster recovery and planning.

### **3.2 DYNAMIC SCALABILITY**

The resources can scale immediately and are available on demand. Low latency across all layers of Web Application like front end, middle layer and database layer.

## **4. PROBLEM STATEMENT**

The main disadvantages concerning e-government is the lack of equality in public access to the internet, reliability of information on the web, and hidden agendas of government groups that could influence and bias public opinions. There are many considerations

and potential implications of implementing and designing e-government, including disintermediation of the government and its citizens, impacts on economic, social, and political factors, vulnerability to cyber-attacks. One of the critical areas where there is duplication of infrastructure and manpower in e-governance is the data center. In this paper, we analyze Cloud computing and examines its application in the context of e-government.

## 5. PROPOSED MODEL

As we know that cloud computing is computing over a cloud, where a cloud consists of grids of commodity machines and a software layer (Haloop), which is responsible for distributing applications data across the machines, parallelizing and managing application executing across the machines and detecting and recovering from machine failures. Haloop consists of four components; each of components must have a specific job [6]. The different components of Haloop are:

U.I ----- user interface

A.C ----- Authentication Check

W.S.M ----- Web Service Mapping

J.S ----- Job Scheduler

Whenever user requests for a e-governance web service to Haloop, it first checks the authenticity of the user after interfacing with Authentic Server then Haloop refers "e-Governance Web Service Mapping" and maps to e-governance web service existing at different locations and fetches the required e-Governance web service from it and submits it to "Job Scheduler" of Haloop which schedules the jobs to the Grid of volunteer commodity hardware. The idea behind volunteer computing is to allow ordinary users on the internet to volunteer their idle computers, processing powers etc. towards solving computationally intensive tasks [7]. The scheduler of Haloop sends the jobs to idle volunteer commodity hardware, the sending jobs are loaded to these idle volunteer commodity hardware and when jobs get computed successfully, they are pulled back by Haloop and are sent to the required thin clients, mobile etc. The load balancing of the idle volunteer commodity hardware is being done by the J.S of Haloop. With the help of cloud computing software applications can be accessed from a network using thin clients/mobiles. Haloop would help e-Governance to

address all types of users along with the favor of expert system. The proposed expert e-Governance system embodies knowledge about one specific problem domain and processes the ability to apply this knowledge to solve problems from the problem domain. The commodity hardware is of two types:

**Active commodity hardware:** It needs e-Governance web-services.

**Idle Commodity Hardware:** The idle commodity hardware is used as volunteer computing commodity hardware. It is used for processing the web services and the processed web services are supplied to thin clients, active commodity hardware etc.

**Fig1** depicts that, when a user requests for a service, the Haloop first checks the nature of the service, if it is merely a request for getting a specific e-Governance web service then it would be provided by Haloop. But if it is a request for an expert advice then Haloop would use the inference engine. For launching the inference engine, it would select volunteer nodes [8]. The inference engine would refer the active commodity hardware for knowledge base. It would exploit knowledge base and would find the expert advice for the user and would pass that to Haloop and from it to end users. Thus hardware commodity would be knowledgebase as well as the hub of different e-Governance web services. In **Fig 2**, the algorithm implies that the user request for a service, if the service is merely an e-Governance web service then Haloop would handle it in some way and if it is an expert advice then Haloop would use inference engine and knowledge base to handle this problem. Thus cloud computing is the natural choice for constructing e-Governance because cloud computing provides a platform for the execution of massive tasks on cloud instead of the execution of tasks on users personal computers, servers etc [9].

## 6. CONCLUSION

The Cloud provides a solid foundation for the introduction of widespread provision of services to various stakeholders. Applications designed using the principles of service oriented architecture and deployed in Cloud architectures will help the government to reduce operating costs and increase end user satisfaction levels. Cloud architectures when will properly apply for developing E-Governance applications, it will transform the nation into an

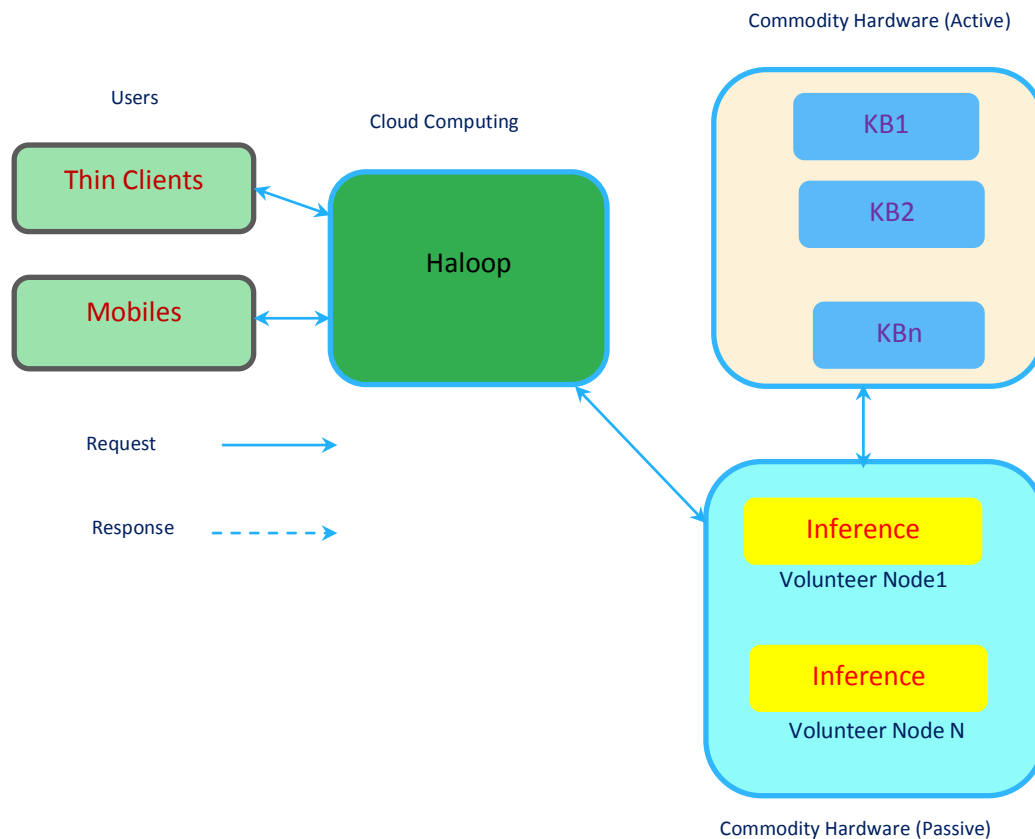
information Society. Service level agreements are the key for the Government to measure how well the services are being performed and provided by the Government. The Cloud will help to provide E-governance services faster and cheaper thereby accelerating the adoption and use of IT for e-services. We have proposed a framework of e-Governance based on cloud computing . Here, we have put forward the different components of Haloop and then specifying the role of each component. We have introduced a new framework of e-Governance Based on cloud computing. Where Haloop is at the top which is being accessed by thin clients or commodity hardware. Further, commodity hardware consists of active commodity hardware and idle commodity hardware. The idle commodity hardware plays the role of volunteer node. After this, we have initiated an intelligent layer that helps the Haloop to behave as an expert system on a specific domain.

Institute of Technology, Mar 2001.

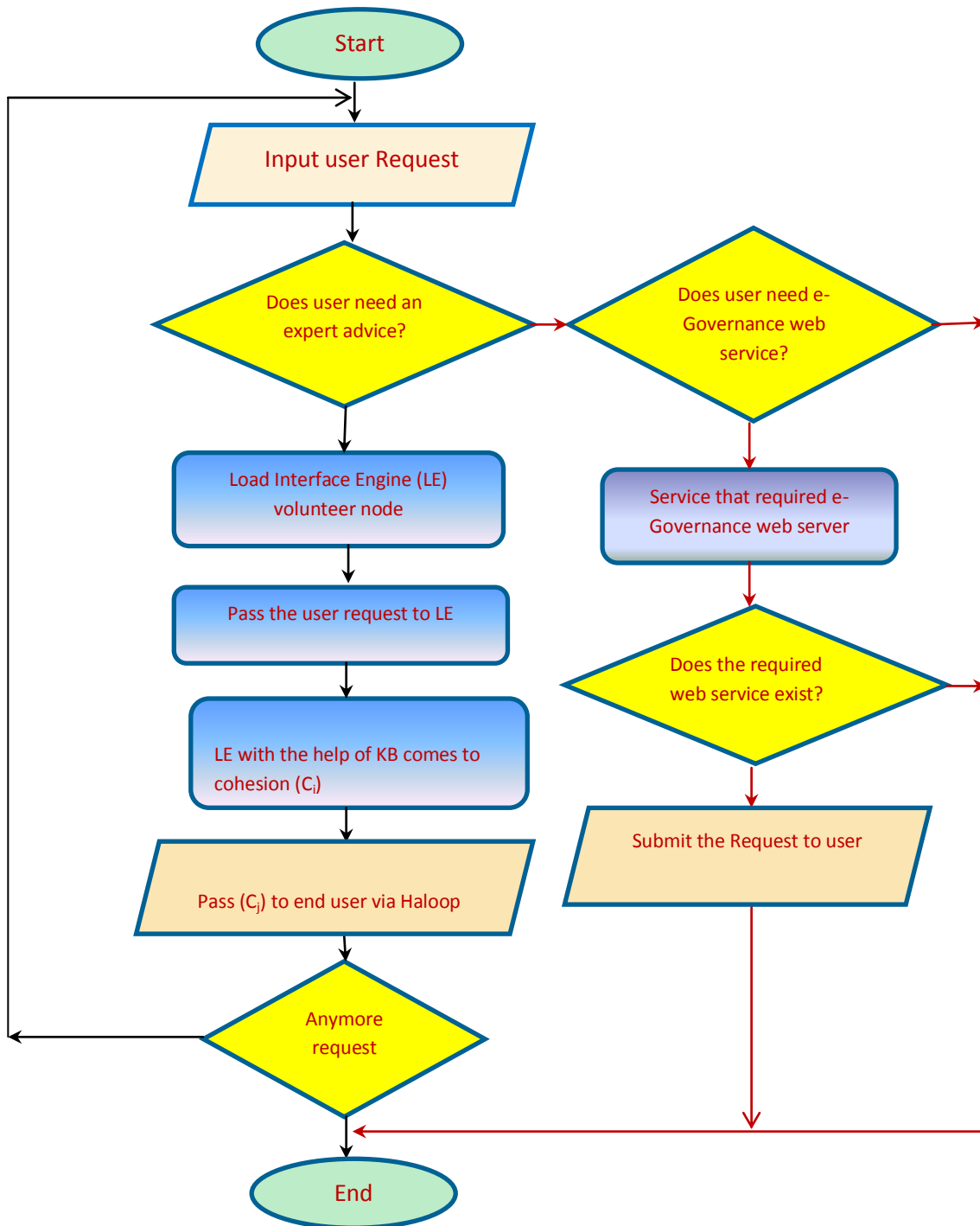
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**Fig 1: User Request Procedure**



**Fig 2: User Request Algorithm**