

# Relationship between Cloud Computing and E-Governance: Benefits and Challenges

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## Abstract

To take the benefits of cost reduction and better utilization of existing resources government has been started to adopt the internet and web based technologies. E-governance provides government services to citizens through the Internet. It is works on two ways communication protocol. But many challenges that delay progress of e-government implementation. It is a technique of computing. It provide better communication style and storage resources through the Internet. It can help the traditional government and other sectors of lives through using the benefits of cloud computing like scalability, reliability, cost saving etc. E-governance, cloud computing and the relationship between E-government and cloud computing, benefits and challenges of creation cloud based e-governance are discussed in this paper.

**Keywords:** *E-governance, cloud computing, Relationship between e-governance and cloud computing*

## Introduction

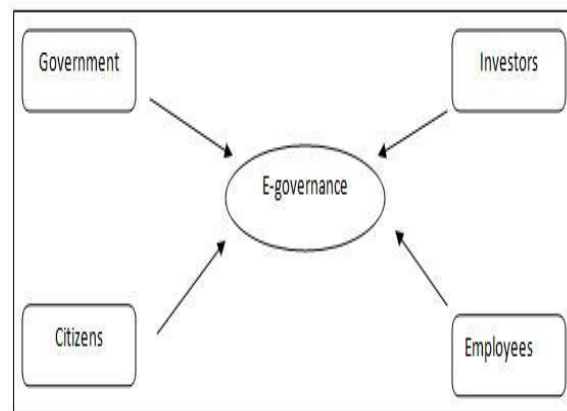
The Internet has changed our lives according to our way of working, learning and communicating. There changes are also affecting the government and its relationship with other sectors of lives. The government to deliver more interactive services to citizens and businesses through e-governance [15]. However, the cost of data storage and the power consumption by the hardware is increased [16, 8]. There are various challenges that delay progress of e-government implementation [12]. Major companies found a new solution to answer these challenges; it was nothing but cloud computing [16]. Cloud computing can help

the traditional government and other sectors of lives through using the benefits of cloud computing like scalability, reliability, cost saving etc [1] The paper is organized into three sections. These sections as the following; the first section will introduced the e-governance, the second section introduces the cloud computing, then the last section introduces the cloud for e-governance.

### E-governance:

E-governance expands to electronic governance. E-governance is the application of information and communication technology (ICT) to strong the communication between government and other sectors [17]. Through e-governance government services are made available to citizens in an good manner. E-governance uses the Internet and World Wide Web to provide services between government and other sectors [1]. E-governance also improves access of government services for citizens and interaction with industry [1]. E-governance is two ways communication protocol. E-governance includes a new style of leadership, debate, policy and investment decisions, access to education and a new

way of managing and distributing information and services [18]. E-governance provides SMART government: S- simple, M- moral, A- Accessible, RT- responsive government [17]. It is a network of in government and public and business organizations [17].



**Figure: E-governance with common variables**

### Types of E-governance:

**Government-to-citizens (G2C):** The government-to-citizens refers to the government services which are accessed by the ordinary people. Most government services are covered by G2C. It helps the standard people to scale back time and cost. Through e-governance citizen can have access the services anytime from anywhere. G2C support services like registration, birth certificate etc [17].

**Government-to-business (G2B):** The government-to-business is refers the exchange of government services between government and business organizations. It is useful for both government and organizations. G2B provides easy online access to government agencies and timely qbusiness information [17].

**Government-to-government (G2G):** The government-to-government refers to the relationship between different government departments, organizations and agencies. This relationship increases the efficiency of government processes [17].

**Government-to-employee (G2E):** The government-to-employee is refers exchange of government services between government and employees. It is Internet part of G2E sector. G2E also provides online facilities to the employee. G2E aims to bring employee together and improvise knowledge sharing [17].

### Benefits of e-government:

- Reducing time, cost and energy of shoppers and organizations.
- Helps in building trust between governments and citizens.<sup>3</sup>

- Improved the users skills like ICT skills, Internet knowledge, computer knowledge.
- Improvement of service delivery and citizens' satisfactions.
- Creation of new business and work opportunities.

### Challenge in E-governance:

E-governance is facing numerous challenges. These challenges are arising from administrative, legal, institution and technological factors. These challenges are following:

**Scalability:** Traditional e-governance cann't be scalable, scalability request changes and updates of hardware and software over place and time.

**Reusability:** Any model developed by government must be reusability. E-governance is being national plan, what's incorporates any software or modules should be utilized by other administrations.

**Physical Security:** providing a secure environment for information science and preventing unauthorized processing any physical access to computing equipment is tough to keep up the normal infrastructure.

**Recovery and backup:** This can be a critical challenge for survival of many organization to make secure of many organizations.

**Digital divide:** Not all people have the appropriate access to computers and Internet; Thans to lack of income, necessary skills and Internet access. Digital divide refers to " the gap between those that have access to the web and people who do not[15].

**Privacy:** privacy is one amongst of the critical problems with e-government. Privacy refers to "freedom from unauthorized access [18]. All services provide by the govt. and private information must be protected with security. Otherwise, citizens will lose trust of e-governance [13].

**Security:** This is offen another critical issue of e-government. All studies have found security is one amongst the foremost obstacles in E-governance [13]. Security refers to protection against any unauthorized access and modifications [12].

**Accountability:** Accountability means being held responsible or in command of one's actions. Accessibility is most considered the foremost pillar of fine corporate governance.

## Cloud computing:

Computing is that the method of computing the information and program are stored over the Net not on your disk. The Net is remarked to as cloud in 'cloud computing'. Cloud: it's something which is present at remote location. In keeping with Merrill Lynch, "cloud computing is remarked because the idea of delivering personal data and business productivity applications from centralized servers". Cloud computing provide is that the means by which we are able to access the applications as utilizes is present at remote location. It's accustomed provides elastic, scalable and on demand services to users on the net.

**Working model for cloud computing:** cloud computing models divided into following two categories: Deployment model and services models.

**Deployment model:** it defines the categories of access to the cloud.

Deployment model	Scope of services	Owned by	Managed by	Security level
<b>Public</b>	This model services are accessible to the general public.	Cloud service providers (CSP)	Cloud service providers	low
<b>Private</b>	this model services are accessible within on organization	Single Organization	Single Organization or Cloud service providers	High
<b>Community</b>	in this model the infrastructure is owned jointly by different organizations.	Several organizations or CSP	Several Organization or Cloud service providers	High
<b>Hybrid</b>	Organizations and public	Organizations and CSP	Organizations and CSP	Medium

**Services Model:** These are reference models on which the cloud computing is base. Different services models are :

Service models		
IaaS	PaaS	SaaS
Infrastructure as a Service	Platform as a Service	Software as a Service
users can access the infrastructure required to run their applications, storage, operating system etc.	Provide runtime environment to users.	Users can access software applications from the cloud.
Used by network architects.	Used by developers.	Used by end users.
E.g. virtual machine, storage etc.	E.g. database, Google App Engine etc.	E.g. Human resource solutions, billing systems, help desk applications.

**Table 0.2. Service models**

## Relationship between E-Governance and Cloud Computing:

An effective e-government system should be trusted, affordable, economical and straight forward maintenance [16, 17]. E-government can use the ability and capabilities of cloud to beat some communication gap. Cloud computing in e-government offers integration management with automated problem resolution, manages security [15]. computing is helps

the govt. going green, reducing pollution and effective waste management [15].

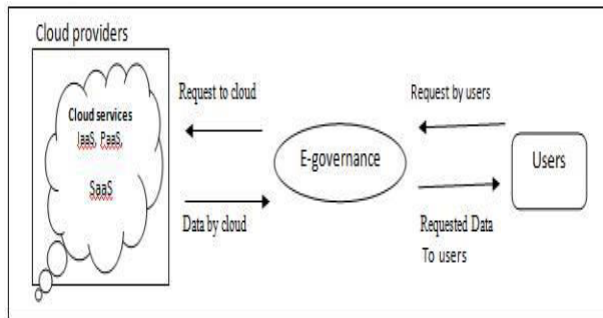


Fig 0.1 working of cloud based E-governance

Cloud computing have many benefits in e-governance. These benefits are discussed within the following sections:

**Scalability:** Scalability is regarded as one of its basic feature. Cloud computing provides services with unlimited scalability [14]. In addition, cloud computing resources such as CPU, servers, hard drives can be purchased automatically in any quantity at any time. Due to unlimited scalability; performance and economic stability is balanced [16].

**Availability and Accessibility:** cloud computing has high availability and Accessibility. Therefore citizens can access them at anytime and from anywhere [16].

**Cost saving:** cloud computing system do not required to purchase and install the ICT equipment and any software on own building [16].

**Backup and Recovery:** cloud computing provides recovery services which is regarded as one of its basic feature. In cloud computing system all the data is stored in the cloud, backing it up and restoring is simpler than traditional way [16].

**Reliability:** The next main benefit is reliability. Citizens can access e-government services through the Internet at anytime and from anywhere. To ensure reliability the traditional computer system redundant data centers. This is costly. Cloud computing services provide high reliability [10].

**Green technology:** cloud computing provides eco-system through virtual services [16]. This helps the government going green, reducing pollution and effective waste management [15].

### Difference Between cloud models and traditional models

Features	Computing Models	Traditional Models
Service	Service can be Accessed before Minutes/Hours.	Service can be Accessed before Days/weeks.
Capital Use	Pay as you Go/ Variable.	Forthright cost / fixed.

<b>Economies of scale</b>	Yes for all Organizations.	For large Organization.
<b>Multi occupancy</b>	Yes.	For the most part no yet can be found in Application facilitating7.
<b>Versatility</b>	Flexible and Programmed.	Manual.
<b>Virtualized</b>	Mostly.	Sometimes.

**Table 0.3 Difference Between cloud models and traditional models**

### Some issues of Cloud Computing in E-governance [10][1]

The use of cloud computing system in the e-government has many benefits. However there are still many issues and Challenges need to be resolved.

**Losing control of data:** The first and big issue is government losing control of data. This can be a big issue because trust can be the key to adoption the cloud computing by public organization. Trust cannot be established easily, especially if there is no third who can guarantee the security and privacy of the information in cloud.

**Security and privacy:** This is one of the critical issues, which is highly associated

with the first one. Because the government and its data are separated and the data are accessed through the Internet. There may be security issues occur on server's client machines and network within the cloud.

**Performance:** This is one of the critical issues. We always require complete and high performance.

**Availability:** cloud computing is also depends on the internet and speed.

**Cost:** Cloud Computing require high cost for the first time.

### Conclusion

E-governance is becoming important in India. E-governance has had a major role in every field of the economy over number of years. E-governance becomes one of the emerging economies due to ICT. Nowadays, government has implemented various initiatives with different projects, such as; digital India, e- Kranthi. However, it still has some challenges that need to be resolved. Many initiatives were initiated by the previous and current government to overcoming these issues and challenges. cloud computing is one of them. Cloud computing is actually working to help break down the barriers of governments. Cloud



computing provides an effective way to share information between citizens, reducing efforts in providing services, budget management and cost effective.

This paper provides an understanding of the role of e-government and cloud computing in every field of economies. And investigate the relationship between cloud computing and e-government, benefits and Challenges.

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