

## **CHAPTER II THEORETICAL REVIEW**

There are many theoretical studies about e- government and cloud computing will be reviewed in this chapter of this research in addition to these previous studies and framework to explain the elements that will be discussed during this research as well.

### **2.1 Historical Review of E-Government and Cloud Computing**

Nowadays, using of internet between citizens is very popular and important. It is affecting human life and increasing benefits to enjoy life. Many governments around the world are in competition to use the best methods to serve their citizens. According to Smith (2010),

An historical assessment can help expand existing knowledge by investigating change and continuity over time (France Bélanger, 2012).

The e-government experience began in the mid-1980s in the Scandinavian countries and was associated with the remote villages in the center and was called the electronic villages (Electronic Villeges).

Lars of the University of Aodneiss in Denmark, the pioneer of this experience and called it telecentres, one of the pioneers of the project is Michael Dill, owner of Dell, which has a leading role in the field of electronic solutions.

In the United Kingdom, the experiment began in 1989 in the Manchester Village project, drawing on the Danish experience on which several sub-projects are based. The "Manchester Host" has been established as a first stage and aims to promote and follow up social, economic, educational and technical developments, the project was launched in 1991. In 1992, a conference of remote huts in the UK was held to follow up these projects, The Council of London has adopted the Puntel Project "Technical Remote Communications" which emphasized the collection, dissemination and development of information by electronic means such as e-mail and remote access to databases.

Other attempts were made in the United States in 1995 in Florida, followed by attempts in various countries of the world, some of which we will address in our study of international experiences.

E-government applications have gone through multiple phases until they reach the current situation in which they are:

- the entry of computers to administrative work and has facilitated the administrative process to a large extent.
- has been completed some services and the implementation of the MIS and can be used to pay bills of services by telephone.
- was the emergence of the international Internet network where the electronic performance was activated.

Here, it should be noted that until now there has not been a state that fully implemented e-government, which confirms the existence of later stages.

The eGovernment has content, service and communication content through which interactive, interactive and informational activities can be grouped together in a single location that ensures continuous contact with the public 24 hours a day, 7 days a week, 365 days a year.

The main reason for the emergence of the concept of e-government is the development of the information and communication revolution in the last three decades of the twentieth century, and the discovery of the Internet, which allowed the transformation of any form of information "texts, pictures, maps, audio clips, videos, data" Digital format »can be moved to the farthest places in seconds.

The idea of e-government is to consolidate all governmental activities and services in one place, the website, to establish a permanent state of communication with the public, and to link and coordinate between all government departments, "the departments of the government apparatus and between government agencies."

The idea of cloud computing was born in 1960 by pioneers like John McCarthy. And Joseph Carl were limited to the processing of financial transactions and census data.

In 1979 the term cloud computing appeared and was first used by Information Systems Professor Chellappa Ramnath

The actual development of cloud computing began in 1999 with Salesforce providing its website to apply electronically, and the company is a leader in using the concept of delivering enterprise applications.

In 2002 Amazon launched its first cloud and was named Amazon Web Services Cloud Where it contains a range of cloud-based services.

In 2006, Amazon also launched its second cloud called AC2 as a commercial service on the Internet.

In 2009, the cloud emerged as Google Cloud, where it created browser-based applications.

The following list briefly describes the evolution of cloud computing:

1. Grid computing: solving large problems with parallel computing
2. Assistive computing: providing computing resources as a measured service
3. SaaS: subscription-based web applications

Currently, many countries have begun to use cloud computing to develop their e-government and provide better services in a way that is easier, faster and available anywhere and anytime.

## **2.2 Theoretical of E-Government and Cloud Computing**

### **2.2.1 Theoretical Review of E-Government**

The e-government represents a new way to provide services to citizens in order to raise the efficiency of government performance and reduce the routine procedures suffered by citizens and provide information and data easily to benefit from the enormous digital revolution, and therefore the various definitions used for e-government, The bureaucracy and the multiplicity and complexity of the

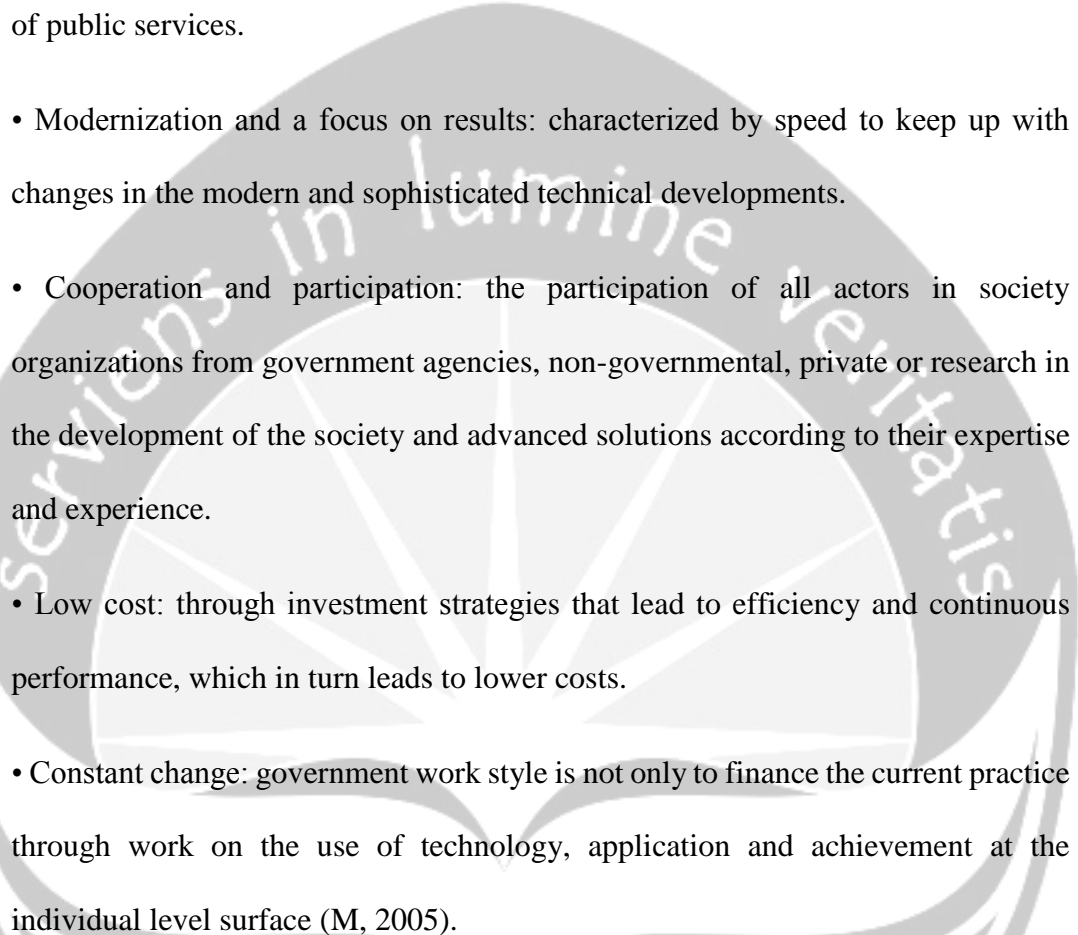
procedures to an electronic manner through which it can provide the service to citizens in an easy and safe way through modern means, which saves a lot of effort and money to the citizen and the government. Thus reducing the cost of service delivery and increasing its quality. In addition to providing all information needs of citizens about services and laws and regulations and legislation through the Internet (M. Alshehri, 2010).

It is also a "default information system which can be of various government agencies to deliver services in an integrated framework, for all categories of beneficiaries, using sophisticated electronic technology, surpassing communicates spatial temporal factor, with a target to achieve quality and excellence of confidentiality, ensure information security and take advantage of data and mutual influence (Islam, 2013).

#### **2.2.1.1 The principles of e-government**

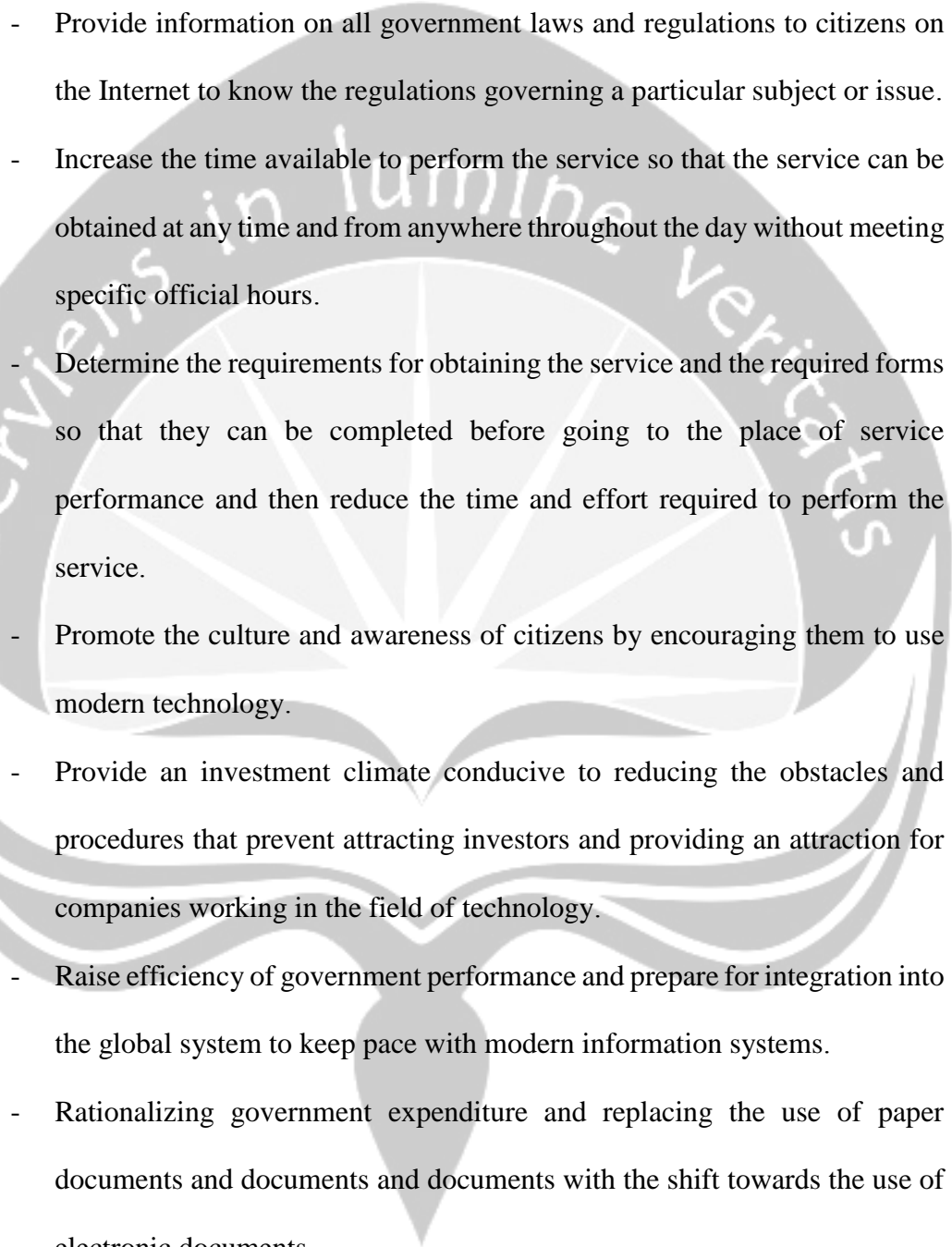
Government Excellence Council in US has put seven guiding principles about the nature of e-government, and are summarized as follows (M, 2005):

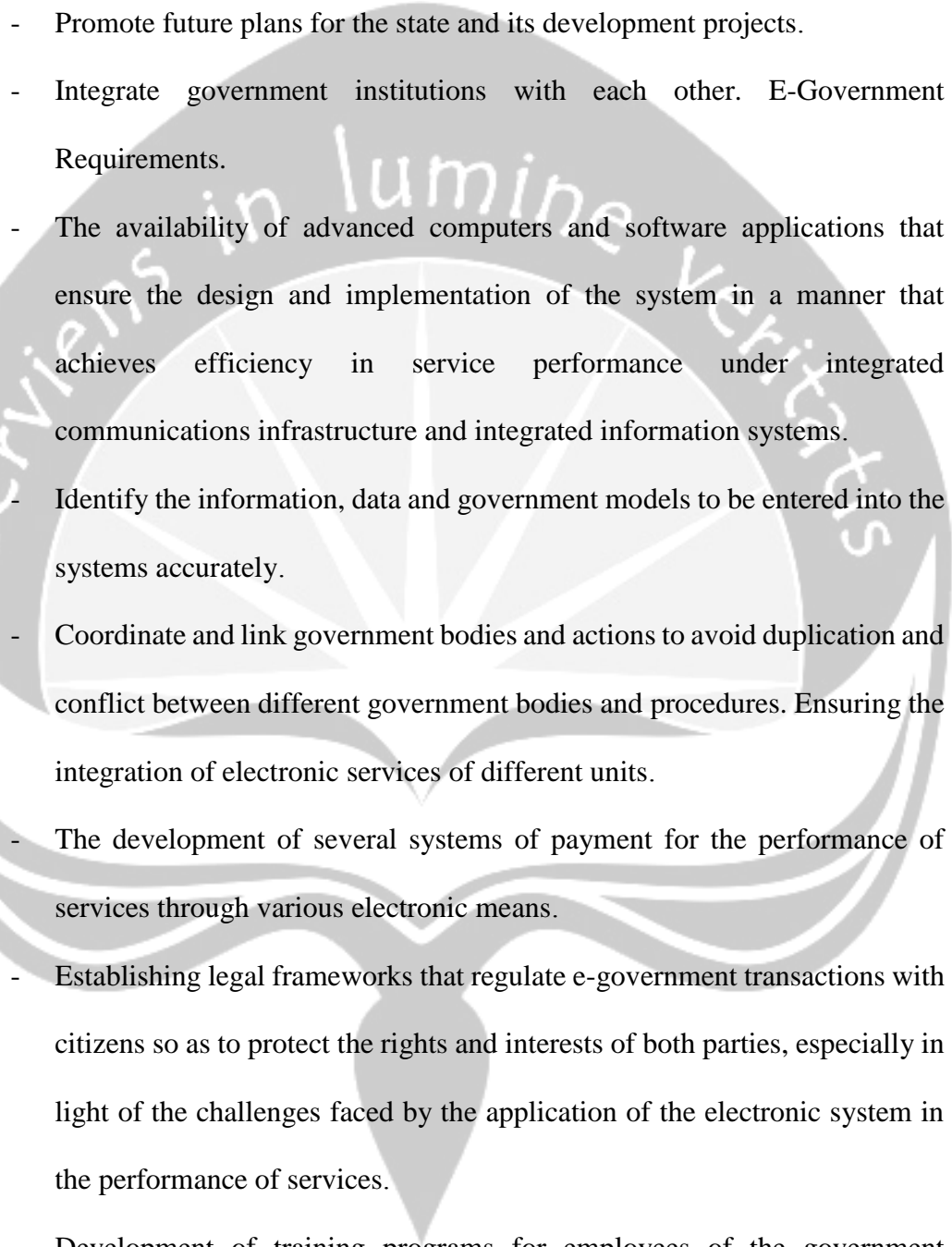
- Ease of use: By connecting the public national, regional and global in their government according to their needs and desires.
- Availability of all: anyone must be available to everyone at home, work, schools, libraries, to be able to communicate with the e-government or from any location fits the user.

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- Privacy and security: enjoy the privacy standards of appropriate security, credibility and confidentiality, which leads to growth and development in the field of public services.
  - Modernization and a focus on results: characterized by speed to keep up with changes in the modern and sophisticated technical developments.
  - Cooperation and participation: the participation of all actors in society organizations from government agencies, non-governmental, private or research in the development of the society and advanced solutions according to their expertise and experience.
  - Low cost: through investment strategies that lead to efficiency and continuous performance, which in turn leads to lower costs.
  - Constant change: government work style is not only to finance the current practice through work on the use of technology, application and achievement at the individual level surface (M, 2005).

#### **2.2.1.2 E-government goals**

E-Government Goals: From this paper, it is clear that e-government is a means to improve government performance to become more efficient. E-government leads to increased transparency and effectiveness in the management of the state. And work on the collection of all services and information of interest to citizens so as to be able to benefit from them easily and can clarify the most important objectives that the e-Government seeks to achieve the following:

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- Provide services to citizens in a safe, easy, fast and low cost and reduce friction between government employees and citizens.
  - Provide information on all government laws and regulations to citizens on the Internet to know the regulations governing a particular subject or issue.
  - Increase the time available to perform the service so that the service can be obtained at any time and from anywhere throughout the day without meeting specific official hours.
  - Determine the requirements for obtaining the service and the required forms so that they can be completed before going to the place of service performance and then reduce the time and effort required to perform the service.
  - Promote the culture and awareness of citizens by encouraging them to use modern technology.
  - Provide an investment climate conducive to reducing the obstacles and procedures that prevent attracting investors and providing an attraction for companies working in the field of technology.
  - Raise efficiency of government performance and prepare for integration into the global system to keep pace with modern information systems.
  - Rationalizing government expenditure and replacing the use of paper documents and documents and documents with the shift towards the use of electronic documents.
  - Get rid of some images of corruption and mismanagement.

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- Achieve transparency by providing information equally to all institutions and citizens.
  - Promote future plans for the state and its development projects.
  - Integrate government institutions with each other. E-Government Requirements.
  - The availability of advanced computers and software applications that ensure the design and implementation of the system in a manner that achieves efficiency in service performance under integrated communications infrastructure and integrated information systems.
  - Identify the information, data and government models to be entered into the systems accurately.
  - Coordinate and link government bodies and actions to avoid duplication and conflict between different government bodies and procedures. Ensuring the integration of electronic services of different units.
  - The development of several systems of payment for the performance of services through various electronic means.
  - Establishing legal frameworks that regulate e-government transactions with citizens so as to protect the rights and interests of both parties, especially in light of the challenges faced by the application of the electronic system in the performance of services.
  - Development of training programs for employees of the government apparatus.



- Media awareness of the services provided by the e-government and how to benefit from them.
- Provide a secure, stable and reliable infrastructure for the provision of electronic services. (M, 2005).

Achieving of learning and life coaching to increase innovation and creativity of the community in order to enable it to compete and presence in the rapidly changing world. The government of electronic public administration is a responsible for providing information and e-services in digital way for citizens and businesses to make them able to communicate electronically from a distance.

E-government makes cosmetic changes in delivery of methods transactions such as government services and public utilities for citizens.

### **2.2.1.3 E-government services**

We could make e-government services in the following points:

**E-services from business organizations to the government:** in this case, the business organizations sell products or provide services to government organizations, as those entitled to the best practices in the use of modern technologies in reducing the cost and improving the quality of management organizations initiatives. Also, contributes to the work flow and the elimination of delays in processing the data and services include: salaries, file complaints and customer care, elections and others (Åsa Wallström, 2009).

**E-government services to citizens:** One of the most important justifications for the emergence of the e-government system is the development of the government's relations with citizens and improve public services provided to them. It also transfers these services to Internet network and other types of digital technology. This relationship includes a variety of important and relevant to the vital role of government in the lives of citizens and civil services such as registration, health, education and social services ... and other activities (Gant, 2008).

In general these basic and other services and related information and transactions daily are continuing with various segments of society. It is conveyed through e-government to instant online services delivered through government online networks and the Internet that is bound to the citizen thus can get these services easily and flexibly (Africa, March 2012).

**E-services between government departments:** there is a large volume of data, information, documents, money that travels through the institutions, bodies and agencies of the government in every day. So modern applications tend to reduce the use of official papers and documents to reduce administrative red tape and reduce the cost of implementing a single treatment and accelerate the time of completion, and then increase the efficiency of the performance of public administrations in the context of security and confidentiality.

Moreover, the e-government hiring networking infrastructure for e-government to carry out transactions require crossing the different administrative levels in the

different ministries, which is reflected on the quality of career management and improve productivity.

**E-government services to business organizations:** the government interacts with the business sector through various roles, the government plays the role of scheme, regulator, initiator of the legislator, protector and catalyst for initiatives that members of the community on trade and business side, social, cultural and various activities including helping private sector companies to achieve better levels of success and competition in the local markets and global, and contribute to initiatives servants. This reduces the burden on government business by adopting processes that significantly reduce the unnecessary data collection (Gant, 2008).

Because the government can issue its decisions and provided to organizations by publishing them on Web sites and organizations can respond to them through the network as well, and has consistently developed countries in the presentation of procedures and regulations, fees and forms online transactions so that the organizations view them electronically and conducting transactions electronically is the need for a broker's office.

#### **2.2.1.4 Success factors of the e-government project**

In order for e-Government projects to achieve the desired objectives and to provide a service of high quality, a number of factors should be available (Khan, March 2010) (Settles, 2005):

**Availability of an appropriate infrastructure:** e-government services contribute to increasing the demand for ICT services, which requires a sophisticated

infrastructure capable of accommodating this increase in demand without sacrificing quality of service. These services should be accessible to all and have high efficiency and reliability. It is important that this infrastructure is universally accessible and that the minimum universal service is available.

**The existence of appropriate regulations and legislation:** e-government services provide new challenges for regulators and legislators, which should have the flexibility and ability to develop regulations and legislation to comply with the requirements of e-government.

- **Reviewing the way in which government transactions proceed:** The application of e-government should not be merely an attempt to use modern technologies to complete routine bureaucratic processes, but should be an opportunity to develop and facilitate such processes to suit e-government methods.

**Provide adequate privacy and information security:** The provision of government services on the Internet with its benefits and facilities, but may allow for attempts to misuse these services. Therefore, appropriate means should be adopted to protect these services in proportion to their importance and sensitivity and commensurate with the requirements of each sector. It is important to have a balance between meeting the requirements for information security and flexibility in providing e-government services in a way that gives confidence to the beneficiary of these services.

**Capacity building and human capacity:** e-government applications need to have a skilled workforce and the ability to deal with new technologies ably.

### 2.2.1.5 Stages of the transition to e-government

Going through the traditional government is turning to e-government successive stages. So, government live up little by little until the move to e-government, which is a development of the traditional government. Restrict stages of the transition to e-government are as following (Karen Layne, 2001) (Seifert, 2003) (Al-Khour, 2011):

**The first stage:** limited government institution's role to maintain, update data and display appropriate means, on a citizen or parties that request it. When the government's role at this point stops, it fails to provide any services beyond the presentation of information. There are no interactive services include reception of data from the user, operation and output as a result, but the government institution only display of its data which is at this stage offer citizens services such as online query for the phone bills or auto irregularities.

**Second stage:** the government move at this stage to provide services and simple transactions to the user, so that the reaction here in only one direction. To ensure services receive the data for the user, adoption and registered with the government institution archive, meaning that the user is developing its data him/herself, which it does or solve a government employee shop. The government offers at this stage citizens these services before receiving licenses and pay online by credit card.

**Third stage:** the government lives up to take another step in terms of services and interactive dealings between the government institution and the user form a bilateral contact. It is allowing the user to enter specific data, and then the public institution

runs electronically this data so that gives the user a new result. At this stage, a connection to the citizen, followed by a reply from the government via the website, and the government offers at this stage, online services such as license renewal services, and obtain official certificates, is the degree of difficulty at this stage to identify the user and confirm his character and the fight against fraud and security process the information.

**Fourth stage:** the presence of network link between the various governments institutions, so the user can access to public services from various government entities interactively which all are in one website. Here, e-government is characterized by the possibility of filing related to government services according to the needs of the user via a single letter port, for example, birth certificate, in addition to the renewal of his license and queried the payment of other obligations, without being forced to the paradox of the website to enter to a new location.

**Fifth stage:** The government institutions communicate with citizens via the means of communication of a suitable, without waiting means to take the initiative, for example, sending a message to the citizens via cell phone to remind them to date to renew a driver's license or pay the phone bill, even entering some data that enables it to access to public service in a timely manner, would receive the license or reimburse phone bill of the mobile device. At this stage e-government has linked itself with citizens in an electronic system and a single, integrated, so fading role of staff brokers completely, becomes performance digital hundred percent.

### **2.2.2 Theoretical Review of Cloud Computing**

The term cloud computing or cloud computing can be defined as a set of services provided by the service provider to a customer or several customers or to an audience of customers over the Internet in order to exploit the capabilities and capabilities of the super service provider without having to buy expensive devices in the company to do the same tasks (Vikram Jeet Singh, 2014).

In the sense that the service provider shares its huge potential and powerful servers to provide diverse services to the customer to save on the customer buy, equip and maintain devices within his company to do such tasks and functions.

Cloud computing is a collection of servers that reside somewhere and provide storage space for the user to store multiple media (video, images, audio files, programs, etc.). Either these clouds are independent or dependent on a Web site or application. (Kostandina, 2013).

Cloud computing can also be a generic concept that includes software as a service and other modern technology trends that share the idea of relying on the Internet to meet the computing needs of users (Mayank Yuvaraj, 2012) (Hariguna, 2011).

The concept of cloud computing has revolutionized the ideas and applications of IT services, especially about the infrastructure solutions on which enterprises rely on facilitating their operations. Many large and small enterprises have found their way into this new system. A recent study by IDC, Cloud computing

will become the main technology in the future on which the entire world depends (Ashish Bhushan Khare<sup>1</sup>, 2012) (Grang,2005).

#### **2.2.2.1 Cloud computing service models**

There are three main different styles of cloud computing could be surmise as following (Vikram Jeet Singh, 2014) (Akram Ali Othman Nasr, 2012) (Sharma, 2011):

##### **IaaS (Infrastructure as a Service)**

The "infrastructure" is offered as a service. Small and medium enterprises can manage the technical infrastructure and software through the Internet in an easy and secure way without the need to have expensive data centers, in addition to benefiting from high availability services and flexibility in changing the size of infrastructure when needed in addition to exempting these companies From the trouble of maintaining and monitoring the infrastructure components of servers, storage units and network.

##### **SaaS-(Software as a Service)**

The software is provided as a service, for example, by Google, through the Google Apps package, which includes text editing, calendar, mail and chat, as well as Microsoft's Office software suite, As a service "within the" Applications as a service "model where applications are available to the user, but the device itself is available as a service, including the operating system and desktop, and can be accessed from anywhere.

##### **PaaS-(Platform as a Service)**



The "computing platform" is presented as a service and the same programming tool is hosted on the cloud and accessible through the browser. This type of service allows programmers in general to develop and build web applications without having to install any software or tools on their computers. They can then deploy these applications without the need for systems and network management skills.

In addition to these service models, four deployments have been added:

**Public cloud:** It is a commercial service provided by the service provider to multiple customers and is located in a place far from the client and is a means of saving costs and time and effort.

**Private cloud:** This type of fastener is usually within the facility so that it can be accessed through the local network and from the Internet and services are provided to the beneficiaries automatically. It can also be hosted by a hosting company. In all cases, the entity can monitor and control the components of the infrastructure.

**Community cloud:** Is the result of collective cooperation between a group of enterprises with the same interests that the infrastructure is shared among them for the purpose of achieving common goals such as information security or regulatory compliance or high performance ... and can be managed internally or externally from a third party.

**Hybrid cloud:** It combines the characteristics of the private cloud and the general. An enterprise can have a private cloud through which it provides some services to beneficiaries, while it uses cloud solutions to provide other services.

Some companies get a private cloud environment within the general cloud of a large commercial provider such as Amazon and then sell the services to other customers, and this also falls within the concept of hybrid cloud.

#### 2.2.2.2 Determinants of cloud computing

(Chinyao Low and Ychsueh Chen, 2011), (Abdullah AL Hammadi, 2015) and (James Lawler, 2011) The new cloud computing model offers a number of benefits and advantages that outperform previous computing models and there are many organizations that adopt and adopt it. However, there are still a number of challenges, which are currently being addressed by researchers and practitioners on the ground. These challenges are summarized below.

***The performance:*** The biggest performance problem may be for some transaction-oriented applications and other dense data applications, and cloud computing may lack proper performance. Users away from cloud providers may also experience delays and sluggishness.

***Security and privacy:*** Companies are still concerned about security when using cloud computing. Customers are concerned about attacks when important information and IT sources are outside the firewall. Solving the security problem assumes that cloud providers follow standard security practices, as described in Section 3.2 (Abdullah AL Hammadi, 2015).

**Control:** Some IT departments are concerned that cloud providers have full control over the platforms. Cloud providers do not usually design platforms for specific companies and their business practices.

**Data transfer costs:** With cloud computing, companies can save money on hardware and software, but they can afford high data transfer rates for the network. The cost of the data transfer rate may be low for small Internet applications, which are not data intensive, but can increase significantly for heavy data applications.

**Accuracy and reliability:** Cloud computing does not offer lasting reliability around the clock. Where there have been some cases where cloud services suffer from power outages for a few hours. In the future, we expect to see more cloud providers, richer services, standards in place, and better practices (James Lawler, 2011).

### **2.2.3 Infrastructure for Adoption of E-Government**

Infrastructure for information and communication technology to change one of the important information system factors. The information and communication technology is an important key to e-government adoption. As a result, it was found that information and communication technology has increased and accelerated the implementation of e-government. It lies in information and communication technology in the successful adoption of e-government, which uses technology to save time and effort through cooperation, in collaboration with government agencies.

For example, a computer network that covers a particular area. As information and communication technologies and key elements in infrastructure, it

is necessary to support the implementation of e-government, in the sense of providing various types of devices and providing information exchange between devices (James F. Kurose, 2013). In addition, the internet provides access to information and Government services from every place and time (Schneider, 2000).

In addition, servers play an important role in e-government, which requires powerful computers and high specifications that can be implemented and host applications that allow connection request services by sending responses. These servers work to improve communication between government and information transfer through the provision of high-speed capabilities for access to government data and services within the organization and among themselves as services on internet and procurement services (Ebrahim, 2005).

Thus, this in turn provides a comprehensive preparation for e-government adoption (Bwalya KJ and Healy, 2010) that appropriate infrastructure for information and communication technologies affects usability trust and is compatible with ease of use and is felt to have a good effect on the general intentions of e-government use and adoption (Bwalya KJ and Healy, 2010).

#### **2.2.4 Role of Cloud Computing in E-Government**

It should be a cost-effective e-government system that is cost-effective, easy maintenance and other functions to meet non-functional. And when it affects the two major thrusts in the field of information technology on e-government. The first trend is the continued development of a stronger computer infrastructure with less cost. The second trend is the continuous improvement of user skills and knowledge

of computer and internet operations. Trends and increase the likelihood of providing electronic services in the public and private sectors are the same. The private sector has noted the rapid development of e-economics and e-business. Governments can use the cloud to reduce the communication gap, especially with people living in remote areas of the country (Cureton, 2009).

Clouds are used to enhance interoperability between various government agencies and scalability, reduce redundancy, tracking / monitoring the effectiveness of government schemes. And it will generate general computing between central and state government resources to reduce costs by using existing infrastructure. Implementation of cloud can accelerate the process of transparency in government. Vaisakha has the ability to transform this sector, not only for the government itself, but also millions of people. E-governance with cloud computing provides unified management with automated troubleshooting and security and end-to-end fixes, budget support based on actual usage of data. At a global level, it can cloud the architecture to provide government benefits to reduce duplication of efforts and increase resource use effectively. Cloud supports governments to go green, reduce pollution and effective waste management. Using a model payment service to use, small and medium enterprises have benefited from the cloud. Since the government needs a large infrastructure, it is important that governments use cloud computing in the long run (Wyld, 2010).

### 2.3 Previous Studies

This chapter includes previous studies in cloud computing and e-government and some of other related journals. Here we will discuss the main objectives of every study one by one as following:

**Hashmi & Kumar (2014)** did research that delivered a proposed framework for adoption, detailing causes, effects of the critical factors and recommendations for the adoption and diffusion of e-initiatives in Uttarakhand. Using Information and Communication Technology the government can offer different type of services to citizen, business, employees or to other government departments. The implementation and delivery cost is high if we are using traditional Infrastructure but some new cost effective trends are now in use like ICT (Hashmi & Kumar, 2014).

In this proposed framework e-governance model for Application Engine system used by the Java, Servlet and java server pages for creating web applications and different type of mobile applications because mobile is the best way to transact the application and it is communicating to easily. In this framework we have to use the Applications as servlet classes, Java Server Pages, static files and data files (Hashmi & Kumar, 2014).

**Wyld (2010)** conducted a study to find out about cloud computing and the importance of this new model of computing. He examined non-military uses cloud computing in governments around the world, from the US to Europe and Asia. He saw resources - people and computing - issues involved in shirting to cloud computing. Finally, he saw "over the horizon" with implications for public sector

organizations and the information technology community as the cloud computing revolution progresses.

Recently, the study problem related to cloud computing seems to be the phrase du jour in much of computing world, and many experts think that cloud computing will be the next big thing.

The cloud model will ultimately serve to transform - in a big way - not only information technology in the government, but also in the corporate world. Hundreds of billions of dollars will be spent domestically in the public sector in the U.S. - and many times around the world - the shift from procuring IT "stuff" to IT services will change drastically. There are no limitations in comparing and investigating the status of related countries (Wyld, 2010).

**Tamara Almarabeh (2016)** conducted a study on the implementation of cloud computing strategy in implementing e-government services that have been studied. This study focuses on the relationship between E-government and cloud computing by outlining the benefits of creation E-government based on cloud computing.

E-government around the world is facing the continued budget challenges. They should also increase the size of their computing data. Therefore, they need to find a way to provide their services to the citizens as economically as possible without reducing the target of desired outcome.

In this study is discussed in detail about the challenges encountered in the implementation of cloud computing for E-government. As a result of understanding the importance of cloud computing because of the new technologies that are

environmentally friendly and inexpensive, this study contributes to improving and minimizing the problems and challenges that exist in E-government so that developed and developing countries need to achieve E-government based on cloud computing.

The study was conducted in Jordan and published in February 2016. This paper did not investigate any cases (eg, Jordan) but it was in general and included general information (Tamara Almarabeh, 2016).

**Rastogi (2010)** did a study. This study is about a model-based framework for implementing cloud computing and cloud computing applications for better E-governance management in developing countries as well.

The critical issue faced by Rastogi (2010) for developing countries is the infrastructure needed to implement E-services. In another study he (Rastogi 2010) also discusses how to fix the E-Governance problems is faced by developing countries. The solution is we can get better service than traditional computing and lower cost with the help of cloud computing. The cloud model will ultimately serve to transform - in a big way - not only information technology in the government, but also in the corporate world. However, the transition will take time. But cloud computing is one of the best options for implementing or improving Government services in the aspects of education, health care and social enhancement of developing citizens.

The study explains the infrastructure in developing countries and the ways of their denial . There is no information about the place and time of the research



taken. This study only explains about the advantages and ways of using cloud computing in developing countries (Rastogi, 2010).

**Ibrahim (2014)** conducted a study to analyze the benefits and challenges of cloud computing through e-government systems. He reviews the existing literature on the proposed model for migrating e-government services to the cloud. Furthermore, this paper classifies and critically analyzes the various types of reviewed models.

Government agencies are constantly looking for ways to improve their service provisioning. Therefore, it is necessary to restructure and using technology to improve the efficiency and effectiveness of their functions.

Cloud computing has unique characteristics. These motivates many researchers to examine the benefits and challenges of introducing this technology to the e-government environment. Other researchers propose a framework or model for adopting cloud computing in the development of e-government services. However, all of these models are conceptual models and researchers do not conduct empirical studies. To help government agencies make the decision to adopt cloud computing for their operations and services provision, more theoretical models and empirical investigations are recommended (Ibrahim, 2014).

This research only explains types of models proposed in the reviewed studies.

**Dung-Hai Liang (2011)** conducted a study on looking closely at global trends. He also studies the global practice of e-government projects and strategies. This is called "Next Generation Internet" in e-government. It uses the advancement

in IT and GIS to improve policy efficiency, effectiveness and knowledge management.

It's important to understand global trends and learn about global best practices on e-government projects and strategies. Learning from the experiences of other countries can shorten the learning curve and avoid the pitfalls that usually accompany new adventures and consequently can save time, money and resources. Learning about the experiences of other countries but avoiding wholesale replication also allows governments to align resources and set strategies based on their priorities after considering their respective social, political and cultural contexts. The measurements in the study consist of determining the number of empirical events, objects or property, or activities in accordance with a set of rules.

The Taiwan government has targeted cloud computing as the focus of e-government and industry development for further advance technologic and its applications. The E-government project focuses on the development of the Information Technology infrastructure and the socialization of web-based government services. Its successful implementation can influence Taiwan's future into good future. Taiwan will occupy the top position in the information technology and information technology and communications. This study only studies cloud computing and infrastructure in Taiwan (Dung-Hai Liang, 2011).

**Sajjad Hashemi (2013)** conducted a study about provide a source of computing, communications and storage resources in a secure environment based on service, as fast as possible, virtually provided through the Internet platform. Because the Services provided in e government are available over the Internet,

cloud computing can be used in the implementation of e-government architecture. Therefore, it provides better service with the lowest economic cost using its benefits.

Over the past 10 years, Internet and Web-based services have grown rapidly and have been widely used by companies. However, the cost of data storage and power consumption by hardware is increased. At the same time major corporations embarked on extensive studies to reduce costs using existing resources and also to support their own businesses.

In this study the method of using cloud computing in e-government has been studied and has been tried to identify the challenges and benefits of cloud for implementation in e-government. Proposals are offered to overcome its shortcomings, encourage government and community partnerships to use this new and economical technology (Sajjad Hashemi, 2013).

## **2.4 Case Studies in E-Government by Using Cloud Computing in another Countries**

There are many countries around the world use e-government with different style and different limits. Here are some cases of Asian countries as example of using this technology in the developed and developing countries. These cases are about Singapore, India and Emirates.

### **2.4.1 e-Government in Singapore**

**Andiappan (2002), Chua (2006) and Ling (2008)** Starting with Singapore where emergence of e-government was due to the government's decision to

computerize civil services in 1981. However, e-government in Singapore is not today, although isolated development focuses on civil service, has reached a level with. The E-government movement in Singapore and an integral part of the much larger national strategy for transforming the island of a city state into a "smart island" where e-economy will be the focus of the economic development plan, the community will become a comprehensive community of citizens and residents , And enjoy a high quality of life. Thus, e-government is seen in Singapore as an integrated development strategy and power in the service of people.

The Government of Singapore has a lot of efforts both in the public service and one of the first steps in the application of e-government, including:

The Civil Computer Instructor Program (CSCP), launched in 1981, marked the first wave of e-government in Singapore. It is intended to provide employment, increase operational efficiency, support better decision-making and some pilot services to the public. Of course, the focus will be on automating many of the traditional work functions and reducing using papers.

One of the early CSCP strategies is called SS-SF - starting from small, fast scale. As information and communication technologies are not familiar with the government and society well in the early stages, it is considered a prudent approach to starting any major initiative on a small scale as the Proto type, once tested and accepted by the community, rapidly deploys systems on a large scale.

For over 20 years, Singapore has provided a lot of e-government services ranging from providing simple information through the implementation of complex

business transactions. The strategic framework for e-government in Singapore is centered on three important relationships - Government for Citizens (G2C), Government to Business (G2B) and Government Employees (G2E).

Under this framework, an action plan for e-government was launched in June 2000 / June, with five main directions:

1. Government restructuring through constant re-thinking in all aspects of government to explore the nature and quality of government interaction with citizens, corporations and employees.
2. Provide integrated electronic services focused on customer needs.
3. Be proactive and responsive through the adoption of "sense and response approach."
4. The use of information and communication technologies to build new capacity and ability to achieve quantum leaps in service.
5. Innovation with ICT through project adoption and experimentation.

pushing a strategic dimension over the government to launch six tactical programmes that would transform public services and meet the changing needs of the three task sectors mentioned above:

1. Work-based knowledge will enable active and collaborative learning and knowledge sharing as part of a culture of continuous learning in the public service.
2. Provide e-services through the integration of government service providers  
Create a one-stop point to connect the public access to government services.

3. Start-up technology initiative to better understand new capabilities and how government and customers can benefit.
4. Improving operational efficiency will be achieved through regular and fundamental questions and answers about the importance and usefulness of functions and processes.
5. Adaptive and robust information and communication infrastructure allows the emergence of a knowledge-based workplace, delivering integrated electronic services and better operational efficiency.
6. Education revenue literacy capabilities will overcome traditional ICTs and skills to develop the ability to take full advantage of ICT's potential to grow.

The work of the e-government plan, as evidenced by the brief description above, is not the end point of a journey; it is a possible process to take Singapore through a long way for e-government. (Andiappan, 2002) (Chua, 2006) (Ling, 2008).

#### **2.4.2 e-Government in India**

**Kaushik (2004), Monga (2008) and Hemant Joshi (2015)** In recognition of the growing importance of electronics, the Government of India established the Department of Electronics in 1970. The establishment of the National Informatics Center later (Nick) in 1977, the first major step towards e-governance in India for bringing "information" and communication in focus. In the early eighties, computer use was limited to very few organizations. The emergence of personal computers to bring computers, retrieval and processing to government offices. In the eighties,

it was a lot of government employees, but computers used mostly in "word processors". Gradually, with the introduction of the best programs, developing computers for other uses, such as database management and information processing. And it helps the advancement of communications technology to improve the diversity of computers and access to it, and start some government departments in the use of ICT for some applications such as tracing paper, files, movement and monitoring program development and staff payroll processing, and generate reports etc.

However, the basic impetus for e-governance was through the launch of NICNET in 1987 - the country's computer satellite network. This was followed by the launching of the Information System (DISNIC) program to computerize all offices in the country where hardware and software are provided freely to the state government. NICNET was extended through the state capital to all the central office in 1990.

The Indian government began the use of information technology in a serious government by launching a number of initiatives. The government approved the first national action plan for e-governance to be implemented during 2003-2007 years. This plan is an effort to lay the groundwork and provide impetus for the long-term growth of e-governance in the country. It proposes the establishment of governance mechanisms and institutional mechanisms at the level and state and local levels to provide a centralized environment that focuses on the environment of citizens and businesses.

The government gave approval in principle to the plan and the overall content of the program. Implementation approach and governance structure. While supporting the plan, it was noted that: The age should be given a weight for the quality and speed of implementation in procurement procedures for IT services. The system in accordance with the incentive states to adopt rapid is combined. The provision of services to citizens should be encouraged through a single window. Of service resources wherever and whenever possible. Attempts have been made to promote and develop public-private partnerships to take full advantage of private sector investment potential; communication should be improved and extended to the level of mass in the country. Regardless of the action plan, and the following measures have been introduced:

1. The adoption of Government of India Information Technology Act from 2000 to provide a legal framework to facilitate electronic transactions. The main objectives of this law are: the recognition of electronic contracts, the prevention of computer crime, make possible electronic submission. Law and come into force in October / October 17, 2000;
2. Establishment of a National Task Force for information technology and program development in May / May 1998;
3. Establishment of an e-governance center for the dissemination of best practices in the field of e-governance to be used by government and central government and acting as contract to provide general information on e-governance, national and international initiatives and information technology policies of the government ();



4. Development of e-office solutions to enable various ministries and departments to carry out their work electronically. It has developed modules such as workflow approval of electronic file drafts, pension, reporting and personal information systems and integrated financial accounting.
5. Create a high energy committee to improve administrative efficiency by using information technology in government.
6. Institutionalize the site by almost all ministries and departments and to provide information on such aspects as goals, policies, decisions and contacts of people and so on. Some of them have started their publication on their wider electronic declaration. And to identify faced-to-face departments repeated with citizens, and change them based on priorities. Thus, it can be inferred from earlier that a good start has made e-government a reality in India, but there is still much to do. It is necessary to sincerely sincere efforts in the future should also be done to maintain momentum (Kaushik, 2004), (Monga, 2008), (Hemant Joshi, 2015).

#### **2.4.3 e-government in Dubai**

**Bastaki (2005), Neerja Sethi (2010) and Al-Khoury (2012)** Dubai e-Government began a journey in 2000 with the official announcement of Dubai e-Government initiatives. Before that, the Government of Dubai to provide services through traditional means.

Developing this initiative become a leading business, Dubai Government has decided to take advantage of its IT infrastructure and services to simplify the rules.

As a result, the Government of Dubai announced a major strategic initiative called "Dubai e-Government" in 2000 with the mission of "Achieving a virtual government by providing e-services that focus on high-quality customers, individuals, businesses and government departments."

In the development of electronic services provided by various government departments, Dubai government used the "e-government model of five phases" as defined by the UN (2002). The launch of the e-government portal ([www.dubai.ae](http://www.dubai.ae) finally) in 2001 with 14 electronic services with each government department providing online services, e-government has officially launched (Al-Shair, 2003) .

Based on the date of the invitation in April 2000, the launch of the portal in October 2001, the entire technical infrastructure prepared for government services provided electronically. In 2003, the number of e-mail service increased to more than 600, about 50 times more than the service in 2001. Nearly 23 government departments offer e-services to citizens and businesses at that time. Of 600 service, transaction and service 211 406 Other services are information (e4all, 2003).

(Chan, 2008) The framework of the implementation of e-government is describing developments in the journey of e-government in Dubai. It consists of four components: infrastructure, information and communication technology, information content and information structure of e-government, and to promote e-government.

To manage and monitor the e-Government initiative better, the Dubai government chooses a centralized approach in which the Dubai e-Government

teams are divided into two teams - Services and Shared Services. The e-Services Unit is responsible for cooperating with government departments to enable its services and also manages the government portal ([www.dubai.ae](http://www.dubai.ae)).

There is responsible for quality and security development to deliver services through portal standards, and the promotion of these services through community outreach programs. On the other hand, the General Service Unit has been established to provide the infrastructure needed for the integration of government departments and applications through Jane and the provision of government technical departments to study and deploy e-government portals in Dubai through a hosted content management system on a website server -government (e4all, 2003).

The establishment of a central government information network (Jane), one of the first steps taken by the strategic planning team for information technology in the Dubai government. Jane related government departments to each other and gave them access to the Internet. At the end of 2005, Jin included about thirty members comprised of government departments and other institutions participating in e-government initiatives.

GIN offers many advantages to government departments. It provides the highest level of security for the exchange of government documents, standard Internet access, standardized Internet connectivity and the elimination of administrative burdens on the networks of various government departments.

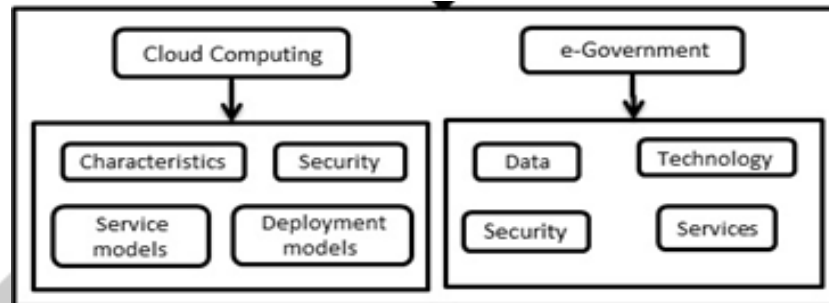
The court, the central body that oversees all government departments in Dubai, has been appointed chairman of the board of directors of the network. Provides a robust network infrastructure for portal services (e4all, 2005).

Based on large differences in technical competence of various government departments and departments equipped with standardized applications, the e-government team in Dubai has decided to adopt a hybrid strategy for e-service implementation: decentralized basic services for each part, Shared Services (Al-Shair, 2005).

Decentralization path is not limited to the independence of government departments and creativity alone, and is quick to allow various government departments to provide services. A common aspect of electronic services is independent of government departments, for example. Validation, authorization, payment, and infrastructure for mobile service platforms and customer service services, decided to be built by Dubai e-Government. It provides a common aspect of the center for government departments through a single centralized entity with certain common tools of well-known synergies with tools (Neerja Sethi, 2010) (Bastaki, 2005) (Al-Khoury, 2012).

## **2.5 Framework of e-government and Cloud Computing**

Based on previous studies and structure of this research, there are four elements for each of e-government and cloud computing as shown in the following (Figure 1):



*Figure 1 Framework of e-government and Cloud Computing*

In addition to these elements e-government and cloud computing include many other elements. Designing and developing complex solutions is such a challenge. One of the challenges is that in the current development environment, application developers must operate at a low level of abstraction. This means taking care of low-level issues such as shared messaging, integration tools, and data modeling with application logic set. Similarly, restructuring and managing solutions require administrators to have a detailed understanding of the logic of the application, making the task time-consuming and error-prone.

There are four main elements for cloud computing as following: characteristics, security, service models and development models. Same way with e-government. There are four main factors that determine e-government which are: data, technology, security and services.

It requires dealing with these challenges effectively professionals with high experience and skill in the field of information technology, which enhances the cost-effective development of e-governance solutions. Usually do not have a solution official to this IT capability, making change management impossible. In

the solutions that have been developed to date, any solution to the allocation of e-governance of existing products to meet the individual needs of government agencies. However, this may not always be the most economical way to develop solutions. In most industries, about 85 percent of operations are the same throughout companies in the industry. It can be expected to be the same part of replicated operations in various government solutions. It is desirable to develop this process once and then re-used for various solutions. It is also possible that this is true for data models, user interfaces, and so on.

For instance, the process of verifying the address in the extension solutions of the driver's license is considered above reusable when developing passport renewal solutions. Similarly, the process of verifying traffic violation records can be provided as a service for insurance business for reuse in auto insurance solutions. And the lack of information (metadata) on the processes and elements available and find it difficult to adapt to the needs to be identified today prevent re-use to find multiple solutions. Anyone can really conclude from the previous discussion that there is a need for a framework that simplifies the development, deployment and management of e-government solutions.