Concepts of E-Governance Development: A Review

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Abstract: E-Government services have become more widely available in developing countries in recent years. This is beneficial for all stakeholders, especially for people, because it enables the facilitation of government services and contacts with citizens, which can then be evaluated for efficiency and effectiveness. Additionally, as internet use and digitalization have expanded, governments worldwide have taken the essential steps toward E-Governance, integrating government procedures with information technology. Despite this encouraging trend, there is evidence of limited citizen uptake and use of E-Government services. Electronic government services are implemented as technological initiatives, with the underlying premise that citizens will use them. As a result, citizens' expectations for these services are not realized. This study evaluates current research on E-Government to identify gaps, limitations, and future research paths. A recent study in this area primarily focuses on the national level, with little concentration on the local level. As a result, future research proposals focus on E-Government at the municipal level.

Keywords: Governance, E-Governance, Categories of E-Government, Good Governance, Communication Technology, Information and Communication Technology (ICT)

1. Introduction

As the world's population continues to rise, new measures are being devised to ensure a higher quality of life for all people. Cities' services are seeing a fresh wave of innovation thanks to various new initiatives and cutting-edge technologies. Although cities and digital technologies continue to evolve, numerous problems to involve citizens in social decision-making remain open and must be addressed (Oliveira et al., 2020). E-Government is about changing how governments interact with people, businesses, government agencies, employees, and other people and groups. It's about making the democratic process better and using new ideas to make life easier for people who live in the country (Shrestha & Tan, 2020).

The term "E-Government" isn't ancient. E-Government uses technology in government to manage government functions electronically and make government services more accessible to citizens. E-Governance also refers to using the government's information and communication technologies (ICT) to deliver services to citizens, enterprises, and across government (Singh, 2019). According to the United Nations, E-Government is described as a government that uses information and communication

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technologies to transform its internal and external business relationships (UNDESA, 2016).

E-Government is a new incarnation of e-commerce that has received significant support from the commercial sector. The main difference is that the government has now adopted it to deliver public services. E-Government helps governments to provide convenient services to citizens. Businesses gain cost-effective access to government services through G2C. G2B and agency-to-agency interactions G2G (Pappel et al., 2019).

E-Governance comprises methods for governing, serving, organizing, and formulating recommendations for global communities centered in metropolitan regions. It seeks to build technologies that facilitate public participation in various domains, which has gained prominence over the previous decade due to its impact on living quality (Lee-Geiller & Lee, 2019; Ronchi, 2019). Furthermore, this concept is connected to Civic Technology (Rosa et al., 2019). Accordingly, Blockchain technology has recently emerged as a powerful platform for building trust and auditable data via a decentralized peer-to-peer network powered by cryptographic algorithms.. In line with this, Blockchain technology has lately emerged as a critical platform for establishing trust and auditable data via a decentralized peer-to-peer network that employs cryptographic algorithms (Temenggung et al., 2020). It enables users to conduct decentralized exchanges of values/assets within trusted networks, hence establishing the Internet of Value (IoV) (Eziama et al., n.d.). We think this is still a very new idea, and it has a lot of implications for the next generation of protocols and how people use them.

Since an information system (IS) is typically a component of a human social structure, its implementation can have adverse cascade effects throughout an organization if user expectations and needs (including cultural and structural issues) are not adequately addressed during the design and development process. As a result, practical evaluation of E-Government requires creating a user-centered or citizen-centric approach. Identifying the factors that influence people's desire to embrace and use E-Government applications and services is a critical topic to address in this regard (Sigwejo et al., 2013).

E-Government is frequently defined as the use of information technology to (1) facilitate citizens' and businesses' access to government information and services; (2) enhance the quality of services through increased speed, completeness, and process efficiency; and (3) enable citizens to participate in a variety of democratic processes. Implementing E-Government requires a fundamental shift in the way government interacts with its constituents and a reinvention of its internal processes and organizational structure (Taha, 2020). E-Government encompasses both internal and exterior use of information technology, both for internal administration and external services (Al-Rzoky et al., 2019; Kerr et al., 2009; Al-dabbagh, 2011).

2. Background Theory

2.1 Types of Interaction in E-Governance

The purpose of E-Government is to facilitate communication between the government and its primary customers, the population (Khan et al., 2020). The client base of the government is classified into four distinct segments: Government to Government (G2G), Government to Citizens (G2C), and Government to Business (G2B). Typically, government interacts with its primary clients over the internet.

- Government to Citizen (G2C).

The G2C E-Government category attempts to provide citizens with a centralized location for online information and services. Citizens are the key government consumers, and they should be able to access the information they seek quickly and efficiently. (Hof & Reichstädter, 2004). They should access government information and services in seconds or minutes, not days, hours, or months. Establishing government portals that enable individuals to access all information about government programs and services via a single website benefits citizens by facilitating instant access to information about all government programs and services.

- Government to Government (G2G).
  The goal of the G2G project is to enable the federal government, state governments, and local governments to work more efficiently together to deliver superior service to the primary customer (Al-Hujran et al., 2015). To achieve this goal, the federal government must make it easier for federal agencies and local governments to collaborate and share information effectively and implement performance evaluation procedures (Submitted et al., 2021). This will assist in reducing reaction times for jurisdictions and disciplines to respond to emergency occurrences and the time required to validate birth and death entitlement information for beneficiaries (Reji & Vidyapeetham, 2021).
- Government to Business (G2B).
  The main goal of the G2B category is to make government business easier by cutting down on the time and money it takes to do so. This can be done by giving people one place to get all the information they need and making it possible to communicate with each other digitally through web pages (United Nations, 2014). Businesses should only submit their business information once, not multiple times. The government should access the business information through common database sharing platforms that are integrated with the government. It also makes it easier for citizens and businesses to find, view, and comment on business rules and regulations. It will also make it easier for businesses to file and follow regulations by allowing them to do so online. It will make it easier for businesses to find and store information (Antoni et al., 2019; Singh & Singh, 2018).
- Government to Employees (G2E)
  It makes it easier for the civil service to run and for the government and its employees to work together. In addition, G2E brings employees together and encourages them to share information about compensation benefits policies, civil rights law, training, and hiring and firing (Town, 2019). By sharing information, G2E expands the government's knowledge base and improves service delivery efficiency (Kumari, 2020; Mapanoo & Caballero, 2018).

Table 1: Types of interaction in E-Governance

E-Government Categories	Services	Communication Channel	E-Service
G2C	Taxes, driver's licenses and registrations, fines, fees, and other types of obligations are all covered.	Through a website or social media, the government and citizens can communicate in two ways about administrative and political procedures.	Delivery of online services such as e-voting, online results publication, and e-participation
G2B	Registration and licensing of businesses, customs and taxation regulations, and employment policy	Online two-way communication channel between government and businesses regarding the business environment and decisions.	e-transactions involving the provision of services such as e-auditing, e-procurement, and e-services
G2G	Governments across the country can share common databases in order to speed up administrative processes.	Exchange of information between the federal government and local governments regarding laws and projects	Collaboration of intergovernmental databases for the purpose of knowledge management.
G2E	Employee performance information, personnel policies, benefits, and career management and development.	Two-way communication between various government departments and their employees regarding labor issues and performance.	Management of knowledge and engagement in personnel information and employment policies via the Internet

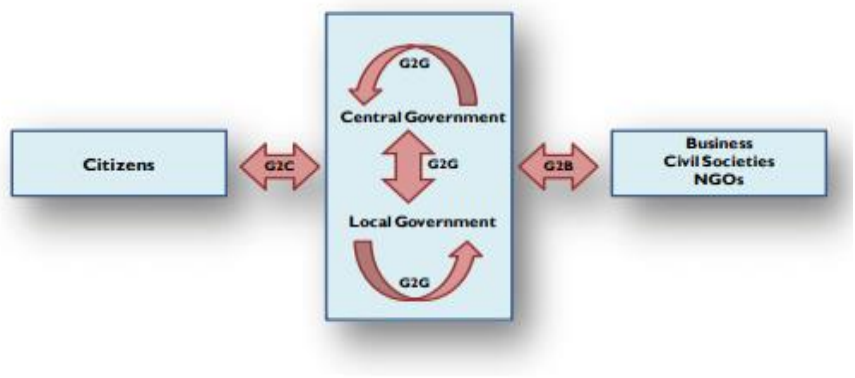

Figure 1: Interaction modes in E-Government

2.2 The Characteristics of an Effective Unified Government Website

The following are guidelines for developing, deploying, and maintaining a robust single government website that is well-supported digitally and is user-friendly:

- Have a unified brand (GOB.MX) and apply consistent brand elements throughout government organizations, such as the same logo and uniform presentation.
- Consistently apply design components derived from a common style guide. Consistent does not necessarily mean permanent; design approaches should vary in response to changing user needs.
- Drawn from a shared style guide. Consistent does not necessarily mean permanent; design approaches should vary in response to changing user needs.
- Design for the profit of users, not the government. User research is critical for developing websites and digital services that are founded on established (rather than assumed) user needs and preferences. One possibility is to enable visitors to interact directly with content via a search engine by incorporating structured data markup into website content (which may enable more prosperous snippets).
- Allow data to guide the design and customization of the website. Develop, monitor, and improve websites through data analytics—a critical tool for identifying areas for improvement that should be built-in, always-on, and easily accessible. Everything should be accessible to everyone. The United Kingdom's Government Design Principles stated, "Accessible design is an excellent design." Everything we create should be accessible, legible, and reading."
- Contextual design. For instance, if consumers access government services or information via cellphones, personal computers, or shared computers, the single government website should support these possibilities.
- Keep it open. Open source code and web design elements are used on many government websites and can be reused. A good practice is to share back code and designs and ideas and plans with other government websites.
- Make sure you know what you want to do. The health service, regulators, arm's-length bodies, and other public sector entities may not want to be part of a single government website. There should be clear rules for making these kinds of decisions so that they don't have to be made ad hoc or on a case-by-case basis.

- Maintain a resilient, Adaptable team to keep the site up and running. Many organizations start with an extensive new website and then do not work on it or change over time, which is not very good. There must be a group of people who keep improving and cleaning up the content, keep the site navigation simple and intuitive, and know how to adapt to users' needs (Glyptis et al., 2020; Zaalishvili et al., 2018; Cao et al., 2016).

2.3 Problems and Challenges

At some point in the first decade of the twenty-first century, it is thought that governments around the world will spend 3 trillion dollars on information technology. Globalization has made it more difficult for people from all over the world and worldwide to compete with each other. The privatization movement has also been a big problem for the public sector to improve its efficiency. People in this country have a big problem: making public services more efficient (Khan, 2008; Baxter, 2017).

2.4 Social and Cultural Constraints

Social and cultural factors like gender, poverty, level of education, class, caste, age, and social exclusion can all make it hard for people to use computers to communicate with the government through ICTs. One of the main issues is the attitude of "change agents." Some people are afraid to use computers and the internet (Santa et al., 2018).

2.5 Political Consensus Constraints

Due to a lack of inclusive political engagement, many stakeholders are skeptical of e-final governance's fate (Schedler et al., 2019). This mistrust derives from the BNP's partial fulfilment of a previous electoral vow. Both the AL and the BNP highlighted their commitment to and perspectives on development in their election manifestos for the October 2001 legislative elections, notably on improving the IT sector (Gupta et al., 2019).

2.6 Human Resources Constraints

Supply of quality human resources and lack of good training infrastructure as one of the key impediments to the smooth development of E-Governance in developing countries (Manoharan & Ingrams, 2018). The quality of E-Governance largely depends on the performance of human resources. Iraq public administration suffers from an acute shortage of trained personnel, which limits its efficient operation (Adjei-bamfo et al., 2019).

2.7 Constraints Associated with the Digital Divide

The digital divide implies a widening of the gap between the “haves” and “have-nots” with respect to ICT across the world. In developing countries, the digital divide occurs where there is a lack of infrastructure (for example, power supply) or access to modern technology: the internet, computers, or mobile phones. It is further compounded by low literacy rates, high poverty rates, slow adoption of technology, the lack of initiative for infrastructural development, and high corruption (Bala & Singhal, 2018).

2.8 Constraints on Infrastructure Development

The operation of E-Governance requires construction of strong technological infrastructure of telecommunications. A significant financial investment is required to develop this infrastructure.

Bangladesh's poor telecommunication infrastructure is a barrier for quality electronic service delivery (Putra et al., 2018). Plans to improve the structure are underway, but it is unclear whether Iraq has the fiscal capability to bear the cost burden of this public investment in the midst of global financial crisis, where the country's economy has been affected (Deng et al., 2018).

3. Literature Review

This section introduces a conceptual framework for E-Government proposed by some researchers that we mentioned below as it is used for identifying the role of IT infrastructure capability to build a concept of shared E-Government.

IT infrastructure is defined as the bedrock of information technology capabilities that enables the development of information technology applications and the support of business operations in both private and public enterprises, including government (Tabesh et al., 2019; Carlos et al., n.d.). It is composed of platform technologies, network technologies, telecommunications technologies, critical data, and essential software applications (Camero & Alba, 2019). Numerous fundamental aspects of information technology infrastructures include centralized management and effective functioning. Thus, IT infrastructure possesses a substantial capacity for assisting firms in adapting to dynamic change, reengineering business processes, and connecting business units or extensive international or geographically dispersed activities. IT infrastructure enables organizations to perform business operations and achieve business goals through connectivity, functionality, modularity, flexibility, serviceability, compatibility, and accessibility.

This study will look at IT infrastructure's reach and range to figure out how well it can be shared. Connectivity, modularity, and serviceability will all be looked at.

1. Connectivity
   The connectivity is defined as the extent to which the government use its IT infrastructure to connect all resources to improve service quality to citizen (Saeed, 2019; Samsor, 2021). The connectivity with adequate reach and range enable the local government to capture information about citizen and spread information to stakeholders through the Internet, virtual communities, and personalized information channels (Alzoubi & Yanamandra, 2020). In addition, connectivity refers to the ability to link data and information to each other among government offices (Scholl, 2018). Successfully using and reusing E-Government in different city and regency depend on the compatibility and connectivity of IT infrastructure elements. Therefore, the connectivity capability is central to information-based innovation, reengineering, and also for managing the rapid change of technological generations (Jha, 2020).
2. Modularity
   E-Government is an information system that has elements connected to achieve a goal. Those elements are built based on the modules in order to manage it easier or more manageable (Fath-allah et al., 2015). To develop the sharing capability of E-Government, the system has to have a sophisticated form of modularity which expands the concepts of share-ability and reusability to both applications and data (Mukhopadhyay et al., 2019). The concept of modularity for shared E-Government implementation has to standardize governance and system processes as many as possible (Fath-allah et al., 2018). It is encapsulated in separate modules, business rules, implementation code, and individual processes that may become far more accessible. Applying the modularity technique to adopt shared E-Government from other local governments has to consider their IT infrastructure including hardware of network, database, and business process

(Wr et al., 2020). Additionally, every government's IS technology, its unique perspectives on data ownership and usage across government agencies, and its approach to IT infrastructure all affect the share-ability data in the adopted E-Government (Virkar et al., 2019). Therefore, the shared E-Government implementation requires modularity capability to adapt rapidly changing environment through standardizing data and business rules.

3. Serviceability

   Shared E-Government enables local governments to serve citizens by providing various services. Serviceability is described as the capacity to provide the types of services required by the public, emphasizing the efficiency of procedures and governance. This shared e-serviceability government is based on studies by (Sabani, 2019; Ghaleb, 2021; Nedeljković & Čabarkapa, 2019). It is divided into four stages: emergence, enhancement, transaction, and linkage. The initial stage is when the government makes static information available online. This stage focuses on delivering information such as contact information for government officials and policy releases. The key concern at this level is the quality of the information. The advancement of technology increases citizens' expectations for E-Government to provide services other than information transmission. The second step of upgrading is serviceability, which facilitates straightforward communication between the government and the public. It is a transitional phase in which the government offers dynamic information and facilitates fundamental one-way interactions. One of the most prevalent instances is online feedback, allowing consumers to lodge concerns about physical government services via the official website. Along with the quality of the information, the timeliness of the information becomes a primary priority throughout this stage (Kareem, 2020; Mamay, 2018). Transaction capability is concerned with enhancing public service delivery through the use of E-Government. It is a transitional step that enables two-way transactions. For example, in Indonesia, an online taxation portal has been implemented as an E-Government service, allowing citizens to file their taxes online. Previously, citizens could only do so by visiting the nearest taxation office in their city. Numerous emerging countries, like Indonesia, are currently in the early stages of this period. E-connection-based government capabilities focus on rethinking public service delivery by creating a single-stop integrated E-Government system via which citizens can promptly access various public services. This is the capability of E-Government development, which presupposes the establishment of horizontal connections between government institutions and vertical connections between central and local governments and the establishment of a reliable infrastructure capable of supporting both (Cho et al., 2019).

4. Political Affairs

   Developing E-Government in developing countries including Indonesia is still undergoing and depending on political transformation (Esselimani et al., 2021; Bharadwaj et al., 2021). Other factors are rigid political structures, inefficiency in governance, and corruption, which have been cited as some of the significant barriers preventing E-Government (Paper & Management, 2020). Furthermore, political instability and bad governance in the local governance of Indonesia have slowed e -government improvement (Vinarski-peretz & Kidron, 2018). For instance, when the local government requires a new system in E-Government including shared E-Government, the government has to seek several permission and budget approval from the head of government unit office, Mayor of city or Regent of regency, and Parliament (Nam, 2018). In other word, the development of E-Government has a rigid political structure with many procedures and inefficiency in governance (Manda & Backhouse, 2016). Therefore, in order to implement the

shared E-Government, this research suggests a political will as the capability for the local government of Indonesia.

5. Skilled IT Human Resources

   The issue of E-Government implementation is rare for skilled IT human resources in local governments (Wairiuko et al., 2018). With skilled IT human resources, the local governments in Indonesia are able to be independent to develop public service systems in their E-Government. This is because the skilled IT staff can help the government to interpret the government service issues into the information systems and develop the appropriate technical solutions including internet network, database, etc.(Joshi & Islam, 2018). The government of Indonesia occasionally provides information systems including E-Government to local government. In this case, the local government has to have adequate skilled IT human resources to adopt those systems that can be implemented in their environment (Valle-Cruz, 2019). Thus, the IT human resources should be having the ability the plan, organize, and lead the E-Government projects and be sensitive to government culture and politics. In conclusion, skilled IT human resources have a significant role in implementing shared E-Government.

Table 2: The overview of shared E-Government development

Ref.	Year	Dimensions	Indicators
(Saeed, 2019)	2019	Connectivity	Connect with the appropriate government office Across platforms, repurposing E-Government sharing resources
(Samsor, 2021)	2021		
(Alzoubi & Yanamandra, 2020)	2020		
(Scholl, 2018)	2018		
(Jha, 2020)	2020		
(Fath-allah et al., 2015)	2018	Modularity	Independent components of the information technology infrastructure Systems that are manageable Systems that are reusable Data and report standardization
(Mukhopadhyay et al., 2019)	2019		
(Fath-allah et al., 2018)	2018		
(Wr et al., 2020)	2020		
(Virkar et al., 2019)	2019		
(Sabani, 2019)	2019	Serviceability	Capacity for information Capacity of Tranters Capability of communication Capacity for connection
(Ghaleb, 2021)	2021		
(Nedeljković & Čabarkapa, 2019)	2019		
(Kareem, 2020)	2020		
(Mamay, 2018)	2018		
(Cho et al., 2019)	2019		
(Esselimani et al., 2021)	2021	Politician Affair	Administration is effortless Simple guidelines Procedures that are simple
(Paper & Management, 2020)	2020		
(Vinarski-peretz & Kidron, 2018)	2018		
(Nam, 2018)	2018		
(Manda & Backhouse, 2016)	2016		
(Wairiuko et al., 2018)	2018	Skilled IT Human Resources	Administration is a breeze Simple regulations Procedures that are straightforward
(Joshi & Islam, 2018)	2018		
(Valle-Cruz, 2019)	2019		

4. Discussion

Article aims to examine existing research in the field of E-Governance. It contributes both theoretically and practically. The study contributes to the growing body of knowledge on the digital distribute and E-Government and local governments' deployment of E-Government. According to a literature review, while there are various supportive variables for implementing E-Governance, they all require significant attention and improvement. From the various geographical contexts, it is evident that supporting elements propel E-Governance toward successful implementation projects, while in a few situations, these factors represent restrictions that must be addressed.

The assessment of the literature reveals a need for additional research on factors such as the digital divide and citizens' security, as well as nations' security in data flow and transaction phases, as well as

falling consumer approval. 'Awareness' necessitates agreement on a definition and the establishment of a few more frameworks for tracking E-Governance progress. Serviceability necessitates additional research and initiatives for enhancing computer literacy and the technical know-how required to use E-Government systems. Additionally, it demonstrates the need for trained IT human resources to research methodologies and frameworks for teacher computer training to rapidly increase citizen computer literacy. Acceptance of users will improve due to creative tactics, effective training, and other skillfully prepared rules. The simplicity of use and customer attitudes require additional research in order to improve and expand e-participation. To control growth efficiently, research is required on economies, government authority, and duties.

5. Conclusion

This article conducts a comprehensive systematic analysis of the literature on E-Governance implementation and the factors impacting its adoption, focusing on developing and underdeveloped nations. The literature review is classified into five main categories namely: (1) connectivity, (2) modularity, (3) serviceability, (4) Politician will and (5) IT Human Resources with specialized skills, in order to conduct an in-depth examination of the research that has been conducted in the relevant area. According to the study's conclusions, all of the categories (together with their subcategories/factors) are crucial for the spread and successful implementation of E-Governance in developing countries. There is a broader breadth of research in the fields of information technology infrastructure, rural internet connectivity to close the digital divide, technologies (hardware and software), and security. Researchers may examine these critical variables while developing methods and frameworks for achieving the goal of effective E-Governance deployment. Government policies, funding, and laws and regulations all play a crucial role in easing citizens' transitions and encouraging enthusiastic e-participation. Legal and administrative reforms contribute to the expansion of E-Governance.

With the development of this concept, it may be possible to assist local governments in building E-Government systems while working with a restricted budget. Finally, it may be discussed that a shared notion of E-Government is preferable for reducing E-Government expenditures in the future.

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