Developing an E-Governance Performance Evaluation Model in Developing Countries (A Delphi Study in Iran)

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ABSTRACT

In the contemporary era, information and communication technology (ICT), through the framework of e-governance, has played a significant role in the advancement and development of various societies. The success of e-governance requires ensuring the effective implementation of e-governance development programs in government-affiliated executive agencies and aligning these programs across all dependent sectors. Accordingly, this study aims to develop a performance evaluation model for e-governance in developing countries. From a purpose perspective, this research is applied, and in terms of data collection method, it falls under qualitative research. The statistical population includes experts in information technology, strategic planning, and public administration. The findings of the research reveal that the main dimensions of the e-governance performance evaluation model are e-administration, e-society, e-citizen, and e-services. This comprehensive model introduces a novel perspective for advancing e-governance in the country. This paper aims to propose a model for evaluating the performance of E-governance in Iran. "Governance" refers to the interactions between government and its broader environment, encompassing political, social, and administrative dimensions. E-governance, or "electronic governance," involves leveraging ICTs at various levels of government and the public sector, as well as beyond, to improve governance processes. Since the application and implementation of E-governance vary across countries, the methods for evaluating it also differ. This study seeks to gather expert consensus on assessing E-governance in Iran, employing the Delphi technique—a research method that collects expert opinions through a series of structured questionnaires. After a brief overview of E-governance and evaluation concepts, the paper presents a model for evaluating the performance of E-governance in Iran. This model, developed through a thorough investigation, introduces a novel perspective on advancing E-governance in the country.

KEYWORDS

Delphi Technique, Developing Countries, E-Governance, Iran, Performance Evaluation.

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Introduction

The primary role of government is to guide society toward achieving the public interest. Governance, as described by Bedi et al. (2001), refers to the connections between the government and its broader environment, including political, social, and administrative dimensions (Shaxnoza, 2024). Sheridan and Riley (2006) define E-governance as a more comprehensive concept that encompasses the entire spectrum of relationships and networks within government regarding the use and application of ICTs, whereas E-government focuses more narrowly on the development of online services. According to this study, E-government represents an institutional approach to political operations within a jurisdiction, while E-governance adopts a procedural approach, emphasizing cooperative administrative relations. This includes establishing fundamental and standardized procedures within the framework of public administration. As Rhodes (2000) noted, E-governance ultimately results in a transformed state of codified governance, a new governing process, or an innovative method by which society is governed.

Despite the fact that many countries utilize control and governance approaches to achieve e-government objectives, significant challenges persist, particularly in developing countries (Abdulnabi, 2024).

Nowadays, many countries focus on controlling approaches and governance aspects to achieve excellence and development via E-governance. In reality, numerous concerns have been raised regarding the benefits of e-governance failing to reach the intended beneficiaries, especially within the context of developing countries (Suri & Sushil, 2017; Klijn *et* al., 2016; Meyerhoff, 2016; UN, 2014). Each country, according to its priorities and attributes, developed special investigations and proper models to cover their charters and obtain requirements regarding their unique aspects (Pintea, 2012; Dash *et* al., 2016; Sangeetha & Rao, 2016).

E-governance provides a transformative approach, enhancing government processes, fostering citizen engagement, and strengthening interactions with and within civil society. It reshapes the relationship between citizens and governments while influencing how citizens connect. Each country's distinct and unique circumstances necessitate a tailored performance model for E-governance (Klijn et al., 2016; Singh, 2013; Navarra, 2007; Allen et al., 2001; Pathak et al., 2007; Sheila, 2005; Pina et al., 2007; Zhang, 2006). The benefits of E-governance can manifest as operational improvements, translating into measurable financial returns (e.g., saving time, effort, and resources), political advancements (such as increased participation, broader democratic engagement, and greater empowerment), and relational improvements through enhanced connections, cooperation, and partnerships between groups (Butt, 2022). Additionally, E-governance offers intangible benefits, including an improved public perception of government (Heeks, 2006; Csetenyi, 2000; Backus, 2001; Stiglitz et al., 2000; Lenk & Traunmuller, 2000; Aichhlozer & Schmutzer, 2000; Allen et al., 2001).

E-governance delivers government services to citizens conveniently, efficiently, and

transparently, providing essential tools and mechanisms for transitional societies to hold both policymakers and service providers accountable for delivering continuous services. It also enables the public sector to ensure citizens receive information tailored to their needs (Pandey, 2023). Ultimately, it contributes to achieving a simple, ethical, responsible, accountable, transparent, efficient, and effective government. For this reason, the development of any country is now dependent on adopting e-governance and penetrating it in various societies (Umbach & Tkalec, 2022).

While many societies have moved toward adopting this approach, practical outcomes—particularly in developing countries—have been limited (Gavriluță et al., 2022). Moreover, e-governance assessment of each country depends heavily on its specific context and conditions. In developing nations, where the level of growth and development in IT infrastructure varies significantly, there is a need for evaluation models tailored to the local conditions of each country (Lee et al., 2022).

Accordingly, examining and evaluating e-governance development is among the most pressing issues for any nation. However, evidence suggests that a comprehensive study on e-governance evaluation, considering the country's cultural context and local conditions has not yet been conducted. Therefore, the present study seeks to develop a performance evaluation model for e-governance tailored to the country's specific context.

This paper presents the findings of research aimed at developing a model for evaluating E-governance performance in Iran, conducted using the Delphi technique. The study begins with a review of the concept of E-governance and the definition of evaluation, followed by an exploration of key characteristics required for E-governance evaluation models. Through a three-round Delphi method involving 15 experts in each round, the research identifies the most suitable conditions for designing this model

Literature Review

E-Governance

Governance, in theory, encompasses a broad spectrum of issues, including administrative reforms, national development policies, democratization, decentralization, corruption, and collaborations among the public, private, and third sectors (Turner et al., 2015). When governance evolves into E-governance—where all government functions such as internal processes, policy-making, decision-making, and service delivery are conducted electronically—it can significantly alter control domains and transactional interactions (Margetts & Dunleavy, 2002). According to UNESCO, E-governance involves the public sector's use of ICTs to enhance service and information delivery, promote citizen participation in decision-making, and ensure greater government accountability, transparency, and efficiency. E-governance introduces new dimensions of citizenship by redefining citizen needs and responsibilities, aiming to engage, enable, and empower individuals (Shailendra et al., 2007).

E-governance initiatives are widespread globally due to their potential to create more citizen-focused governments while reducing operational costs (Saxena, 2005). For

developing countries seeking to leverage ICTs for effective governance, adopting "intelligent intermediaries" during the early stages of E-government implementation is recommended. These intermediaries act as human facilitators between citizens and digital infrastructure, ensuring broad access to government services. Such intermediaries can include existing professionals, public servants, NGOs, or community-based organizations that integrate diverse ICT channels to deliver E-government services effectively (Suri & Sushil, 2017; APT, 2012).

E-governance involves using electronic methods to (1) facilitate interactions between government, citizens, and businesses and (2) streamline internal government operations, enhancing democratic processes and the efficiency of governance and business. Information technology (IT) enables organizations to boost revenue while reducing the need for middle management and clerical roles, a phenomenon often referred to as the "flattening" of organizations (Backus, 2001; Zwahr et al., 2005).

In conclusion, the potential of E-governance is, at least theoretically, immense. Its benefits encompass improved operational efficiency and reduced time, effort, and material resource utilization while maintaining or increasing output through automation, digitalization, and process transformation. Additionally, E-governance enhances operational effectiveness by introducing new and improved services, increasing user convenience and satisfaction, and reengineering processes related to leadership and decision-making.

E-Governance in Developing Countries

Most public sector reforms in developing countries are carried out by external organizations such as the World Bank (Kuzior et al., 2023). As a result of these interventions, many developing countries have faced significant pressure, leading to considerable challenges in their administrative systems. Public administration in these countries has remained bureaucratic and centralized (Mykhalchenko, 2022).

In many developing nations, public sector reforms were primarily driven by external forces, particularly institutions like the World Bank and other international donors (McGill, 1997). However, certain countries, such as Turkey, did not face significant pressure to adopt these reforms (Sozen & Shaw, 2002). As a result, despite economic restructuring efforts in countries like India, public administration in developing nations often remained deeply bureaucratic and highly centralized (Saxena, 2005).

A notable distinction between E-governance in industrialized and developing countries lies in the availability of ICT infrastructure. In industrialized nations, the E-governance movement was largely spurred by Internet technology, enabling cost-effective and remote access to government services. However, these countries already had ICT systems for internal government operations. Conversely, in developing countries, ICT usage within the public sector was minimal, resulting in limited or virtually non-existent ICT infrastructure (Bhatnagar & Bjorn-Andersen, 1990; Yong & Koon, 2003; Klijn et al., 2016). Consequently, the initial phase of E-government in these nations centered on digitizing internal operations and services.

However, E-governance is not a quick solution for achieving economic growth, reducing budgets, or establishing clean and efficient governance. Instead, it represents a gradual and often challenging process that entails financial and political costs and risks (Abdulnabi, 2024; Working Group on E-Government in the Developing World, 2002). These risks can be substantial (Heeks, 2003). Consequently, poorly planned and executed E-government initiatives risk squandering resources, failing to provide valuable services, and heightening public dissatisfaction with the government. Additionally, E-government efforts in developing countries must consider their unique circumstances, requirements, and challenges.

Evaluation and Governance

Evaluation

Over the past three decades, there have been significant theoretical and methodological advancements in evaluation. The primary goal of evaluation is to assess the quality of a program by forming a judgment (Hurteau et al., 2009). It involves collecting, analyzing, and documenting information regarding the value of an object for the organization. Evaluation is considered crucial for every organization, as it is widely recognized that all projects or initiatives carry different levels of risk (Wu & Guo, 2015; Elkadi, 2013). Evaluation is scientifically valuable across various disciplines, providing key insights for decision-making in fields like administration, psychology, and political science (Kanchanawasee, 1994; Mahapoonyanont et al., 2012):

- **Administration**: The findings can serve as tools for administrators to manage and track work performance, ensuring it aligns with effective and efficient plans.
- **Psychology**: Evaluation can function as a method to stimulate interest and raise awareness among workers.
- **Political Science**: Evaluation can be used as a means of ensuring accountability and as a strategy to garner public support.

The American Evaluation Association has established a set of guiding principles for evaluators. The sequence of these principles does not suggest any hierarchy, as their importance may differ depending on the situation and the evaluator's role. The principles are as follows:

- Systematic inquiry
- Competence
- Integrity / Honesty
- Respect for individuals
- Responsibility for the broader and public good

Although the terms "evaluation" and "assessment" share significant similarities, it is essential to distinguish between them. Assessment refers to reviewing data about something or someone from various sources to improve current performance. In contrast, evaluation involves making judgments about the performance of something or someone by measuring it against established standards.

E-governance is an innovative approach to managing a country, grounded in specific indicators and criteria. It seeks to examine performance in the current state using defined standards, avoiding subjective judgments. In this context, the term "governance evaluation" has been adopted (Umbach & Tkalec, 2022)

E-Governance Performance Evaluation

Just like the definition of E-governance, E-governance evaluation does not have a unique definition. It should be characterized according to each country's particular situation and requirements (Madon, 2004; UNDP[1]; Suri & Sushil, 2017). In line with the UN's[2] definition of E-government as an innovation in the public sector, E-governance can be seen as a process of innovation management within the public sector. Since 2001, various UN departments have developed their criteria for evaluating E-governance (Devendra, 2010).

Developing countries face numerous challenges during the implementation of E-governance. These challenges span political, social, economic, and technological sectors (Alam & Hassan, 2011). The first step in measuring E-governance is evaluating information infrastructure availability, which includes access to computers, the Internet, and networks within government institutions. Additionally, the extent to which ICT is integrated into governmental activities for internal purposes, such as communication, data collection, storage, and resource management, should be assessed (Georgiadou et al., 2006; i4donline).

E-governance must be measurable, transparent, and observable (Shaxnoza, 2024).

E-governance initiatives and service levels must be measurable, visible, and transparent, allowing progress to be tracked through benchmarking and effective monitoring and evaluation (MoUD, 2010).

Emphasis should be placed on critical aspects such as E-procurement and E-transactions. Government functions can be broken down into several components: the leadership responsible for E-governance, the infrastructure, the data systems, the preparedness level of each government, and knowledge sharing of best practices and resolving conflicts related to implementing E-governance projects. These elements should work to improve the conditions for E-governance in each country, supporting the National E-governance Plan's goal of delivering reliable, cost-effective, and transparent citizen services by applying international best practices and guidelines (DIT, 2010). Therefore, the following questions should be considered when evaluating the quality of the process:

- Do respondents interpret the same terms in the same way?
- Are the scales and scoring mechanisms consistent?
- Is there equivalence in constructs, structure, measurement, and scale?
- How do people understand the concept of "Trust" (Madon, 2004)?

In E-governance evaluation, several key characteristics must be considered, including

1. The United Nations Development Programme *(*UNDP*)*
2. United Nations

E-services, infrastructure, data/information, cost savings, service transformation, human resource development, dependability and adaptability, process reengineering, and social benefits (Tan & Subramanian, 2005).

Various models with different approaches have been proposed for evaluating e-government services. However, selecting the best model is not feasible, as the models depend on each country's specific conditions and priorities (Lee-Geiller & Lee, 2019).

As an accepted approach, in different research and studies about e-governance evaluation, according to special conditions and priorities of different countries, different methods and models were developed to evaluate the performance of e-governance, and there is no best practice or a standard model for this purpose (Pina, 2007; Potnis, 2010; Okezie *et* al., 2013; Sarkar, 2007; Saxena, 2005).

Isah et al. (2024) conducted a study evaluating the implementation of e-governance in university service delivery in Nigeria. The findings indicate that online tuition payment systems have been effectively implemented and utilized by stakeholders, leading to improved efficiency and user satisfaction.

Raei and Baradaran (2023) proposed a maturity model for e-governance based on evaluation components. Their findings classify six components: management, strategy, technology, security, individuals, and evaluation and measurement. The maturity model comprises four levels: awareness, purposeful striving, managed, and optimized ecosystem.

Umbach and Tkalec (2022) evaluated e-governance through e-government initiatives. The findings highlight that e-governance performance factors are sensitive to contextual elements, such as policy domains, systemic setups, institutional configurations, and administrative traditions. Consequently, e-governance evaluation is often restricted to specific tools and contexts, including websites, projects, and policy initiatives.

Suri (2022) examined the effectiveness of strategy implementation and e-governance performance in India. The study revealed that strategic planning, precise governance execution, e-services, and user e-information are key factors for the successful implementation of e-governance.

Lee et al. (2021) presented a model for evaluating e-governance websites. Their findings suggest that transparency in information presentation, consistency in information delivery, website security, and citizen participation are critical factors for assessing website effectiveness.

Methodology

Delphi method (Juri, 1971; Norman & Olaf, 1963) was devised in the early 1950s by researchers at RAND Corporation (Landeta, 2006; Rowe & Wright, 1999). The technique is often referred to more as an art than a science. In essence, it is a structured, multiple-step process for collecting and condensing the knowledge from a group of experts to deal with a complex problem using a series of questionnaires interspersed with controlled feedback (Humphrey-Murto et al., 2020; Yousuf, 2007; Linstone & Turroff, 2002).

The Delphi method aims to maximize the benefits of group input while minimizing the potential for conflict within the group (Sourani & Sohail, 2015; Lang, 1998). To effectively use this approach, the researcher must ensure that the following four essential characteristics are met:

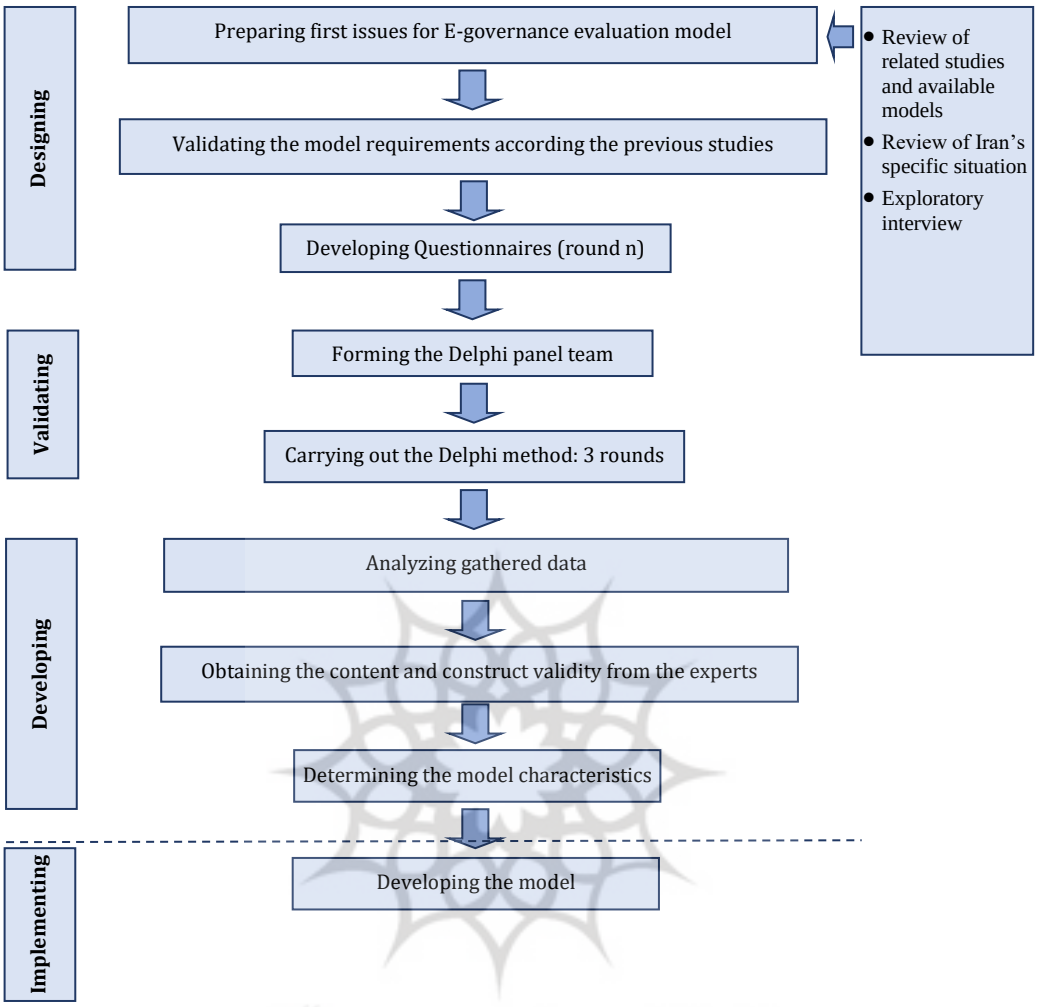
1. Structured questioning in which questionnaires are used. With this method, the moderator can control the whole research process and foster more concrete results.
2. Meaningful interaction of questionnaires is performed in numerous rounds to allow panelists to re-evaluate their responses.
3. Controlled feedback is achieved by giving overall group responses to the panelists in rounds (except Round 1). This means that all the responses of the panel group are considered in the subsequent assessment rounds.
4. Anonymity is an important characteristic because every panelist is free to express his/her views without feeling pressured by other more powerful group (Rowe & Wright, 1999).

As shown, it starts with a deep study of background and contents, so after refining the requirements, it goes ahead with data validation and developing a questionnaire for the Delphi panel. This process ends with analyzing the gathered data, defining the required dimensions, and developing the model.

The research design used to develop the model is shown in Figure 1. It includes three steps:

1. Designing the research instrument,
2. Validating the research instrument,
3. Developing the model, and
4. Implementation.

Figure 1.
Research Design for Iran's E-governance Performance Evaluation Model



(Source: Researcher's Findings)

Given that the Delphi method is an appropriate method for discovering innovative and reliable ideas or gathering suitable information for effective decision-making, and considering the lack of access to experts in the field for conducting interviews, alongside the preference for questionnaire-based responses and the availability of relatively adequate literature on e-governance, the researcher has used the Delphi method to extract the conceptual model of the study.

Findings

Exploratory Interview

For this purpose and to learn more about potential E-governance evaluation models and make any comparisons, exploratory interviews were conducted among knowledgeable people (in this field). The findings of the exploratory interviews were used in developing our model requirements.

Validating Instrument

Two discussion sessions were arranged to validate the model requirements outlined earlier. The participants for these sessions were selected using snowball sampling and were invited by the researcher's supervisor based on their knowledge and experiences.

Developing Round n Questionnaires

According to the reviewed studies, interviews, and previous rounds' results, a questionnaire was developed for each round. According to the requirements of each step, the questionnaires included open and closed questions.

Forming the Delphi Panel Group

According to Adler and Ziglio (1996), the Delphi panel members must meet four key criteria:

1. Having in-depth knowledge and experience,
2. Being dedicated to participation,
3. Having sufficient time to engage in the Delphi process,
4. Possessing strong communication skills.

For this study, the criteria for selecting the Delphi panel included at least 15 years of experience and knowledge in IT management, strategic planning, and governmental affairs. The snowball sampling method was employed to identify and invite qualified individuals to be part of the Delphi panel (Skulmoski et al., 2007).

According to Skulmoski (2007), the number of panelists in previous research has ranged from around 4 to 171 "experts." However, Dalkey (1975) suggests that having 15 or more experts is ideal for maximizing reliability and minimizing group error when assessing the degree of consensus.

According to Adler's criteria, the required knowledge for developing such a model and through the snowball technique, 15 people were selected for this research. In compliance with the available proper people for this study and panel, as in related studies, the research team believed this amount of panel members was adequate and could lead the research to the planned results. Table 1 shows the characteristics of the Delphi panel.

Table 1.
Characterization of the Respondents

Delphi Panel			
		N	%
Age	40-50	5	33
	50-60	7	47
	60-70	3	20
Qualifications	Ph.D	8	53
	MSc, MBA	5	33
	Other	2	14
Area	IT Management	5	33
	Strategic Management	4	27
	Governmental issues	6	40

(Source: Researcher's Findings)

Procedures of the Delphi Method

Each Delphi panel member was contacted either in person or by phone. They were provided with a brief explanation of the research objectives and what was expected from them. The panelists were given ten days to complete the questionnaires for Round 1. A reminder email was sent two days before the deadline to notify panel members about incomplete tasks.

The data collected from Round 1 were analyzed and used to create the questionnaires for Round 2. New items were added to the Round 2 questionnaires based on the suggestions provided by the experts in Round 1. The research team checked both face and content validity. Panel members were also allowed to refer to the comments from other panel members and their ratings in Round 1. They were given ten days to respond to the Round 2 questionnaires, and a reminder email was sent two days before the due date.

The questionnaires for Round 3 were prepared, and the research team checked the face and content validity again. All panel members were given ten days to respond.

Delphi Data Analysis

All feedback and comments gathered from the three Delphi rounds were documented and analyzed. Consensus among the experts was confirmed after each round before proceeding with any interpretations. The reliability and consistency of the experts' responses were also evaluated.

Young (2007) proposes that researchers can assess the consensus achieved in Rounds 1 and 2 to present it to the panel as an indicator of reliability. If consensus is reached after Round 2, it suggests that the researcher has effectively summarized the panel's feedback from Round 1. Using this method, the researcher can provide solid evidence to support the assumption that an acceptable level of reliability has been met (Fish & Busby, 2005).

Consistency refers to the stability of responses. In this study, the response patterns of experts were analyzed in terms of consistency across rounds. This is crucial for ensuring that the collected data has adequate quality and reliability for reference.

Model Development

In the Delphi method, we asked the invited experts to tell us which model(s) is (are) better for assessing the E-governance function in Iran.

In the first round, we insisted that Iran's existing issues and conditions, such as economic, political, and sociological factors, IT infrastructures, E-government situation, and E-governance perspectives, must be regarded.

The first-round question was about selecting a suitable model for Iran's E-governance performance evaluation, using the available models, or developing a new model according to the specific situation of Iran. Table 2 shows the result.

Table 2.
Round 1 Analysis Result

Question	Frequency
Using the available models	0
Developing a new model according to specific situation of Iran	15

(Source: Researcher's Findings)

The questionnaire of the second round focused on the model kind. Among the suggestions, such as sequential and multidimensional models, all experts agreed on using a multidimensional model.

After the third round of analysis, the answers showed that the model should consist of two dimensions: main *characteristics*- (E-administration, E-Citizen, E-services, and E-society) (Heeks, 2006) and their corresponding *attitudes.* The EAF framework also mentioned some attributes for assessing the performance of E-governance). Thus, the developed model is structured around these two dimensions: characteristics and attributes. In the following sections, we first discuss these dimensions and then present the model.

Model Dimensions

Characteristics

As previously discussed, the first dimension of our model encompasses three core areas of E-governance:

A. Enhancing government processes: E-Administration
B. Connecting citizens: E-Citizens and E-Services
C. Fostering interactions within civil society: E-Society

A. Enhancing Processes: E-Administration

These initiatives primarily focus on improving the internal operations of the public sector and include:

Reducing process costs: Automation can substitute high human costs with lower ICT costs, boosting efficiency and productivity. Information aids decision-making and implementation during downsizing or rightsizing initiatives. The aim is to address excessive public sector spending and/or inefficiencies in various processes.

Managing process performance: This involves planning, monitoring, and controlling the performance of resources (human, financial, etc.). Information plays a critical role in this process by offering insights into performance metrics and standards. The goal is to use resources more efficiently and effectively.

Establishing strategic connections within government: This involves linking departments, agencies, levels, and data repositories within the government to strengthen the ability to investigate, develop, and implement strategies and policies guiding government actions. Automation and information systems aid by digitizing existing communication channels, while transformation creates new digital channels. The purpose is to give clearer direction to public sector processes and foster a more evidence-based approach to policymaking and decision-making.

Creating empowerment: This entails redistributing power, authority, and resources from traditional centers to new locations within processes. Transformation supports this by establishing new information flows to decision-makers and implementers in new locations. The objective is to reduce costs, accelerate decision-making, and/or create more flexible and responsive processes.

B. Connecting Citizens: E-Citizens and E-Services

These initiatives focus primarily on the interaction between government and citizens, either as voters/stakeholders from whom the public sector gains legitimacy or as consumers of public services.

Engaging with citizens: This involves providing citizens with information about government activities. Informatization and transformation support this by establishing new information flows from the government to citizens, which are essential for accountability. The objective is to pressure government employees to perform well and improve public understanding of government operations.

Listening to citizens: This aims to amplify citizens' involvement in governmental decisions and actions. Informatization and transformation facilitate this by creating new information channels from citizens to the government. The goal is to make public decisions more responsive to the views or needs of citizens.

Enhancing public services: This focuses on improving the quality, convenience, and cost of services delivered to citizens. ICTs are leveraged to provide informational components of public services digitally. The direct benefit is obvious, but there is also an indirect benefit in terms of saving citizens' time and money that would otherwise be wasted due to inefficient service delivery.

Since all these initiatives depend on the new connectivity offered by ICTs, they are relatively recent additions to E-governance, highlighting the extensive opportunities for development it offers. The sequence begins with publishing (delivering information to citizens), progresses to interaction (a two-way information exchange between citizens and government), and advances to transactions (executing government processes online).

These aspects have been largely overlooked in developing countries, yet even simple publishing activities can have a substantial impact. Citizens in information-poor regions may be vulnerable to exploitation, such as bribery, due to their lack of basic knowledge about government services- specifically, who provides them, where they are available, and how to access them.

C. Building External Interactions: E-Society

These initiatives focus on the relationships between public agencies and other organizations, including other public agencies, private sector service providers, non-profit organizations, and civil society institutions.

Improving collaboration with businesses: Enhancing the interaction between government and businesses, including digitizing procurement processes and services to improve their quality, convenience, and cost. This utilizes the full potential of ICTs to provide the informational components of public services to businesses in a digital format. The main rationale is to reduce costs and improve quality within the government while indirectly enhancing the efficiency and responsiveness of local businesses.

Developing community: Strengthening the social and economic capacities of local communities. ICTs reinforce existing information connections and create new

connections within communities and between them and other institutions. The goal is to enhance community members' wealth-creation potential and overall quality of life.

Building partnerships: Strengthening relationships between institutions. This involves two components: first, building government partnerships by improving ties between government and other institutions, such as NGOs or international organizations, and second, strengthening civil society partnerships, such as those between NGOs. ICTs help to improve current information exchanges and establish new ones between these institutions. The purpose is to create a strong economic, social, and political fabric within society.

Like E-citizens and E-services, E-society initiatives rely on the connectivity enabled by ICTs, making them relatively new elements within E-governance. They represent significant development opportunities offered by E-governance.

Attributes to Be Assessed

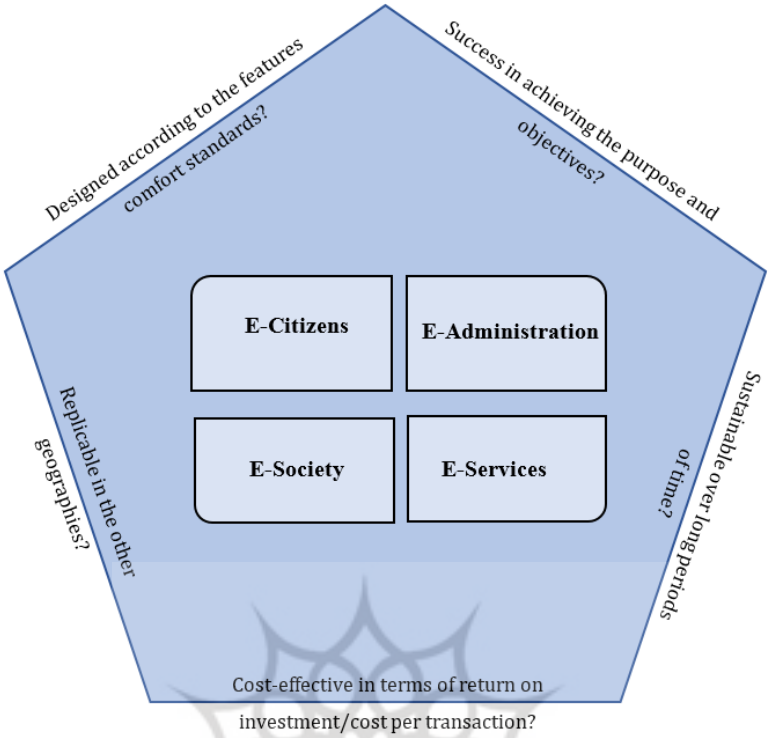
The developed model must be comprehensive, holistic, and, above all, fulfill the designed objectives. Essentially, the EAF should provide clear and unambiguous answers to questions such as the following (EAF, 2004):

A) How far has the Project achieved its purpose and objectives?
B) Has the Project been designed and developed with all the elegant and comfortable technological features widely accepted by architectures and standards?
C) Is the Project sustainable over long periods of time, with or without the motive force that initiated the Project?
D) Is the Project cost-effective in terms of return on investment or in terms of cost per transaction?
E) Is the Project replicable in other geographies?

Model Development

Figure 2 presents the model we developed through the Delphi method. This model shows innovation in evaluating E-governance measurement for Iran, addresses special requirements of Iran, and mentions the malfunction of different parts of E-governance.

Figure 2.
Evaluation Model of Iran's E-governance Performance



(Source: Researcher's Findings)

Electronic administration, citizens, services, and society are the characteristics that must be assessed in Iran (the center of the model). This model can evaluate E-governance through criteria such as performance, technology, and costs (sides of the model). The criteria mentioned here can enrich the evaluation process and direct the characteristics of the model to a right and tangible understanding of E-governance performance.

The panel believes that, among the different available models, this one is the most suitable for Iran. They noted that the current activities in Iran's E-government can be seamlessly integrated into this model, which also has the potential to encompass future developments in both electronic government and governance in Iran.

Discussion and Conclusion

E-governance is a new movement in most developed countries. It demonstrates a country's power to use IT to prepare better governance in society. It uses IT at various levels of government, the public sector, and beyond to enhance governance.

According to the concept and definition of E-governance, there is no unique definition for it; according to its special condition, each country has a different usage and description of this concept. E-governance performance must be evaluated. Therefore, we looked forward to developing a model for performance evaluation of Iran's E-governance. After a literature review, with the help of a 15-member Delphi team and three rounds of circulation, we developed a model. Using the Delphi method, we evaluate and prove the performance and reliability of the model.

The model developed through this research, according to the special requirements of Iran, consists of two main dimensions: E-administration, E-citizen, E-services, and E-society are characteristics of this model and five items related to target, technology, and cost are the attributes.

Examining the progress and performance of governmental institutions in implementing e-governance requires specific components and factors for evaluation. By introducing a performance evaluation model for e-governance, governments, and their associated organizations can assess the progress of programs, their effectiveness, deviations from planned actions, and more. In this context, the present study aims to propose a performance evaluation model for e-governance in developing countries. While e-governance has been extensively studied to identify influencing factors, implementation barriers, and deployment models, limited research has focused on performance evaluation, especially in developing countries, where this subject is critically important. This study, therefore, offers both theoretical and practical innovations. To achieve its objectives, the researchers utilized the Delphi method. The final model includes four dimensions: e-administration, e-society, e-citizens, and e-services.

In evaluating e-governance, attention must be paid to all dimensions derived from government, society, and citizens. E-administration refers to a set of mechanisms that transform paper-based processes into electronic processes, aiming to establish a paperless office. E-administration leads to cost reduction, better process management, strategic communications with the government, and employee empowerment.

E-citizens have at least basic knowledge of ICT concepts, the ability to connect to the Internet, and the capability to send and receive electronic messages via email. They can search for information, services, goods, and software they need through the Internet. Evaluating e-governance must consider the extent of digitization among citizens, which can be improved by providing technology-related education, such as internet basics, email fundamentals, computer skills, search proficiency, and more.

Another dimension of e-governance evaluation is e-services, services provided over the internet to deliver fast, remote services without requiring physical presence. E-services improve interactions with citizens and increase their participation in e-governance.

To achieve e-governance, the existence of an e-society is essential. An e-society is characterized by electronic interactions between governmental organizations and other entities, such as private service providers, non-profit organizations, and civil society institutions. This dimension underscores the interconnectedness and collaboration among various sectors within an electronic framework.

Comparison with Previous Research

In comparing the results of the present study with the previous research, it is observed that in service delivery, the results of this study align with the findings of Isah et al. (2024) and Suri (2022). In terms of the knowledge and information required by citizens for e-governance, the results of this study align with the findings of Suri (2022) and Lee et al.

(2021). The technology, security, and personnel components mentioned in the research by Raei and Baradaran (2023) are consistent with the results of the present study.

Suggestions for Government Officials

It is recommended that government managers and officials use new technologies, such as artificial intelligence, in e-governance evaluation programs. It is also suggested that authorities prepare an e-governance roadmap, which defines the goals and final objectives for achieving e-governance within specified timeframes, considering the country's facilities and infrastructure, and using it for evaluation purposes. To improve e-services, one of the components of the evaluation model related to the government, it is suggested that this dimension be improved by increasing bandwidth, enhancing internet speed, removing filtering, and reducing users' access costs to e-services.

Limitations and Suggestions for Future Research

Time constraints and the inability to generalize the results of this study to other organizations due to the qualitative nature of the research are some of the limitations encountered. This is because different interpretations of the phenomenon under study are possible. Given the qualitative approach of the research and the lack of validation of the extracted model by other researchers, it is suggested that the extracted model be tested using a quantitative methodology. Researchers should also design a model through in-depth interviews to better understand the subject. Furthermore, it is suggested that other researchers identify the dimensions and components using statistical techniques such as the analytical hierarchy process, analytical network process, and best-worst method
and determine their significance in evaluating e-governance. It is also recommended that other researchers determine the state of e-governance in the four identified dimensions, compare them, and, based on that, identify the strengths and weaknesses of e-governance in the country. Finally, it is recommended that other researchers work on developing key performance indicators for evaluating e-governance.

REFERENCES

Abdulnabi, S. M. (2024). Issues and challenges of implementing e-governance in developing countries: a comprehensive analysis of civil service models. Cogent Business & Management, 11(1), 2340579.

Adler, M. & Ziglio, E. (1996). Gazing into the oracle. Bristol, PA: Jessica Kingsley.

Aichhlozer, G., & Schmutzer, R. (2000). Organizational challenges to the development of electronic government. In Proceedings of the 11th International Workshop on Database and Expert Systems Applications (DEXA'00), IEEE Press.

Alam, S., & Hassan, S. (2011). Problems when implementing egovernance systems in developing countries: a quantitative investigation of implementation problems in Bangladesh. Master's thesis in Informatics, University of Boras.

Allen, B.A., Juillet, L., Pacquet, G., & Roy, J. (2001). E-governance and government online in Canada: partnerships, people, and prospects. Government Information Quarterly, 18, 93-104.

APT (Asia-Pacific Telecommunity). (2012). APT report on e-government implementation in Asia-Pacific developing countries and its challenges and obstacles. ASTAP/REPT 5 (ASTAP20, Bangkok, 2012).

Backus, M. (2001). E-governance in developing countries. IICD Research Brief, 1(3), 1-51.

Bedi, K., Singh, P.J., & Srivastava, S. (2001). Government net, new governance opportunities for India. New Delhi: Sage.

Bhatnagar, S.C. & Bjorn-Andersen, N. (1990). Information technology in developing countries. Elsevier, North-Holland, Amsterdam.

Butt, S. (2022). Challenges and Benefits of E-Governance in the Education Sector of Pakistan during COVID-19. Pakistan Social Sciences Review, 6(2), 576-591.

Csetenyi, A. (2000). Electronic government: perspectives from e-commerce. In Proceedings of the 11th International Workshop on Database and Expert Systems Applications (DEXA'00), IEEE Press.

Dalkey, N. C. (1975). Towards theory of group estimation. In H. A. Linstone, & M. Turoff (Eds.) The Delphi method techniques and applications, 231-256, Massachusetts: Addison-Wesley Publishing.

Dash, S. S., Sethi, I. P. S., & Gupta, O. P. (2016). Measuring performance outcome of e-Governance projects through eTaal. Proceedings of the 3rd International Conference on Computing for Sustainable Global Development (INDIACom).

Devendra, D. P. (2010). Measuring e-governance as an innovation in the public sector. Government Information Quarterly, 27, 41–48.

DITa. (2010). Quality assurance framework (QAF) for e-governance applications. Dept. of IT, India.

DITb. (2010). Conformity assessment requirements for quality assurance in e-governance. Dept. of IT, India.

EAF. (2004). E-governance assessment frameworks for E-governance (assessment & replication) division, E-governance and e-rural group. National Institute for Smart Government (NISG).

Elkadi, H. (2013). Success and failure factors for e-government projects: A case from Egypt. Egyptian Informatics Journal, 14, 165–173.

Fish, L. S., & Busby, D. M. (2005). The Delphi method. In D. H. Sprenkle & F. P. Piercy (Eds.), Research Methods in Family Therapy, 2nd Ed, New York: Guilford.

Gavriluță, N., Stoica, V., & Fârte, G. I. (2022). The official website as an essential E-governance tool: A comparative analysis of the Romanian cities' websites in 2019 and 2022. Sustainability, 14(11), 6863.

Georgiadou, Y., Rodriguez-Pabon, O., & Lance, K. T. (2006). Spatial data infrastructure (Sdi) and e-governance: A quest for appropriate evaluation approaches. Journal of the Urban and Regional Information Systems Association, 18 (2), 43-55.

Heeks, R. (2003). Most e-government for development projects fail: how can risks be reduced? Government Working Paper Series, Institute for Development Policy and Management, University of Manchester, Manchester, U.K.

Heeks, R. (2006). Understanding and measuring eGovernment: International benchmarking studies. UNDESA Workshop, Budapest, Hungary.

http://www.eval.org/Publications/GuidingPrinciples.asp

http://www.i4donline.net/issue/nov03/quantifying.htm

http://www.unesco.org

Humphrey-Murto, S., Wood, T. J., Gonsalves, C., Mascioli, K., & Varpio, L. (2020). The delphi method. Academic Medicine, 95(1), 168.

Hurteau, M., Houle, S., & Mongiat, S. (2009). How legitimate and justified are judgments in program evaluation?. Evaluation, 15, 307-319.

Isah, I. S., Chiroma, A. A., & Dance, A. M. (2024). Assessment of E-Governance Implementation on Service Delivery in Nasarawa State University, Keffi (2017-2021). AKSU Journal of Administration and Corporate Governance, 1(1), 89-100.

Juri, P. (1971). The Delphi method: substance, context, a critique and an annotated bibliography. Socio-Economic Planning Sciences, 5 (1), 57-71.

Kanchanawasee, S. (1994). Evaluation theory. Bangkok: Chulalongkorn University Press.

Klijn, E. H., Sierra, V., Ysa, T., Berman, E., Edelenbos, J., & Chen, D. Y. (2016). The influence of trust on network performance in Taiwan, Spain, and the Netherlands: A cross-country comparison. International Public Management Journal, 19(1), 111-139.

Kuzior, A., Pakhnenko, O., Tiutiunyk, I., & Lyeonov, S. (2023). E-governance in smart cities: Global trends and key enablers. Smart Cities, 6(4), 1663-1689.

Landeta, J. (2006). Current validity of the Delphi method in social sciences. Technological Forecasting and Social Change, 73(5), 467-482.

Lang, T. (1998). An overview of four future methodologies. Retrieved August 13, 2012, from http://www.soc.hamaii.edu/~future/j7/LANG.html.

Lee, T. D., Lee-Geiller, S., & Lee, B. K. (2021). A validation of the modified democratic e-governance website evaluation model. Government Information Quarterly, 38(4), 101616.

Lee-Geiller, S., & Lee, T. D. (2019). Using government websites to enhance democratic E-governance: A conceptual model for evaluation. Government Information Quarterly, 36(2), 208-225.

Lenk, K. & Traunmuller, R. (2000). A Framework for electronic government. In Proceedings of DEXA2000, IEEE press, 271-277.

Linstone, H. A., & Turroff, M. (2002). The Delphi method: Techniques and applications. Journal of Marketing Research 18(3), 210-233.

Madon, S. (2004). Evaluating the developmental impact of e-governance initiatives: an exploratory frame work. EJISDC, 20 (5), 1-13.

Mahapoonyanont, N., Mahapoonyanont, T., & Samrit, S. (2012). The development of a project evaluation model for basic education Institutions. Procedia - Social and Behavioral Sciences, 46, 277–282.

Margetts, H., & Dunleavy, P. (2002). Cultural barriers to e-government. In Better Public Services through e-government: Academic Article in support of better public services through e-government, National Audit Office, London, UK.

McGill, R. (1997). Civil service reform in developing countries: a strategic perspective from an institutional development base. International Journal of Public Sector Management, 10 (4), 254- 267.

Meyerhoff, N. M. (2016). E-governance and stage models: Analysis of identified models and selected Eurasian experiences in digitising citizen service delivery. International Journal of Electronic Government Research, 12(2), 107–141.

MoUD. (2010). Toolkit for monitoring and evaluating for e-governance under JNNURM. MoUD, India.

Mykhalchenko, O. (2022). E-governance in the management decision-making process. Ekonomichnyy analiz, 32(1), 81-94.

Navarra, D.D. (2007). The architecture of global ICT programmes: a case study of e-governance in Jordan. Proceedings of the 9th International Conference on Social Implications of Computers in Developing Countries, São Paulo, Brazil.

Norman, D., & Olaf, H. (1963). An experimental application of the Delphi method to the use of experts. Management Science, 9(3), 458-467.

Okezie, C.C., Kennedy, O. C., & Chidiebele, U. C. (2013). Performance analysis of smart infrastructure model for E-governance integration. Academic Research International, 4 (4), 219-231.

Pandey, J. K. (2023). Public trust and collaborative e-governance performance: a study on government institutions and services. Transforming Government: People, Process and Policy, 17(4), 510-531.

Pathak, R. D., Singh, G., Belwal, R., & Smith, R.F.I. (2007). Governance & corruption – developments and issues in Ethiopia. Public Organization Review, 7(3), 195-208.

Pina, V., Torres, L., & Acerete, B. (2007). Are ICTs promoting government accountability? A comparative analysis of e-governance developments in 19 OECD countries. Critical Perspectives on Accounting, 18(5), 583–602.

Pintea, M. O. (2012). Performance evaluation: Literature review and time evolution. Annals of University of Oradea, Economic Science Series, 21(1), 753-758.

Potnis, D. D. (2010). Measuring e-Governance as an innovation in the public sector. Government Information Quarterly, 27 (1), 41–48.

Raei, B., & Baradaran, V. (2023). A Staged Capability Maturity Model for E-Governance Based on Classification of the Evaluation Components. Public Administration Perspective, 14(2), 93-137.

Rhodes, W. R. (2000). Public administration and governance. In Debating governance: authority, steering, and democracy, Oxford University Press.

Rowe, G., & Wright, G. (1999). The Delphi technique as a forecasting tool: issues and analysis. International Journal of Forecasting, 15(4), 353-375.

Sangeetha, G., & Rao, L. M. (2016). Modelling of E-governance framework for mining knowledge from massive grievance redressal data. International Journal of Electrical and Computer Engineering (IJECE), 6(1), 367-374.

Sarkar, S. (2007). E-Government adoption and diffusion. National Informatics Centre, Bidyut Bhavan, Saltlake, Kolkata.

Saxena, K.B.C. (2005). Towards excellence in e-governance. International Journal of Public Sector Management, 18 (6), 498–513.

Shailendra, C., Palvia, J., & Sharma, S.S. (2007). E-Government and E-Governance: definitions/domain framework and status around the world. In Foundations of e-government, A. Agarwal et al. Ed. CSISIGeGOV, 2008, 1-12.

Shaxnoza, J. (2024). Impact of E-Governance on Public Service Efficiency. International Journal of Law and Policy, 2(10), 31-47.

Sheila, V.S. (2005). E-governance at the local government level in the Philippines: An assessment of city government websites. Philippine Journal of Development, 32 (2), 135-168.

Sheridan, W., & Riley, T.B. (2006). Common wealth center for e-Governance. E-Gov Monitor.

Singh, A. (2013). A Critical impulse to e-governance in the Asia Pacific. Springer.

Skulmoski, G. J., Hartman, F. T., & Krahn, J. (2007). The Delphi method for graduate research. Journal of Information Technology Education, 6, 1-21.

Sourani, A., & Sohail, M. (2015). The Delphi method: Review and use in construction management research. International journal of construction education and research, 11(1), 54-76.

Sozen, S., & Shaw, I. (2002). The international applicability of 'new' public management: lessons from Turkey. International Journal of Public Sector Management, 15 (6), 475-486.

Stiglitz, J., Orszag, P., & Orszag, J. (2000). The Role of government in a digital age. http://www.ccianet.org/

Suri, P. K. (2022). Effectiveness of strategy implementation and e-governance performance. Evaluation and Program Planning, 92, 102063.

Suri, P.K., & Sushil (2017). Strategic Planning and Implementation of E-Governance. Springer.

Tan, W., & Subramanian, R. (2005). E-Government: Implementation policies and best practices from Singapore. Electronic Government strategies and implementation, Idea Group Publishing, 305-324.

Turner, M., Hulme, D., & McCourt, W. (2015). Governance, administration & development: Making the state work. Macmillan Press.

Umbach, G., & Tkalec, I. (2022). Evaluating e-governance through e-government: Practices and challenges of assessing the digitalisation of public governmental services. Evaluation and program planning, 93, 102118.

UN (2014). UN E-Government Survey 2014: E-government for the future we want. United Nations, New York.

UNDP. "E-Governance in Azerbaijan". http://www.un-az.org/undp/doc/egov/intro.php

Working Group on E-Government in the Developing World. (2002). Roadmap for e-government in the developing world. Pacific Council on International Policy, http://www.pacificcouncil.org

Wu, J., & Guo, D. (2015). Measuring e-government performance of provincial government website in China with slacks-based efficiency measurement. Technological Forecasting & Social Change, 96, 25–31.

Yong, J.S.L., & Koon, L.H. (2003). E-government: enabling public sector reform, In e-government in Asia: Enabling public service innovation in the 21st century. Yong, JSL (ed.), Times Media, Singapore, 3-21.

Young, D.E. (2007). Effective leadership characteristics for student performance as perceived by high performing Texas High School principals: A Delphi study. PhD Thesis, Texas A & M University.

Yousuf, M. (2007). Using experts' opinion through Delphi technique. Practical Assessment, Research & Evaluation, 12(4), 1–8.

Zhang, J. (2006). Good governance through e-governance? Assessing China's e-government strategy. Journal of E-Government, 2(4), 39-71.

Zwahr, T., Finger, M., & Mueller, P. (2005). More than digitization—The transformative potential of E-Governance: An exploratory case study. Proceedings of the 38th Hawaii International Conference on System Sciences.