

# Analyzing E-Governance Assessment Initiatives: An Exploratory Study

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## ABSTRACT

This paper presents an exploratory study aimed at identifying, exploring, and analyzing current EGOV assessment initiatives. We do so based on data obtained from a desktop research and from a worldwide questionnaire directed to the 193 countries that are part of the list used by the Statistics Division of the United Nations Department of Economic and Social Affairs (UNDESA). The study analyses 12 EGOV assessment initiatives: a) seven of them are international/regional EGOV assessment initiatives performed by the United Nations (UN), European Union (EU), Waseda-IAC, Organisation for Economic Co-operation and Development (OECD), World Bank (WB), WWW Foundation, and Open Knowledge Network (OKN); b) five of them are country-level EGOV assessment initiatives performed by Norway, Germany, India, Saudi Arabia, and the United Arab Emirates. Further, the study provides general results obtained from a questionnaire with participation from 18 countries: Afghanistan, Angola, Brazil, Cabo Verde, Denmark, Estonia, Finland, Germany, Ghana, Ireland, Latvia, the Netherlands, Norway, Oman, Pakistan, the Philippines, Portugal, and Slovenia. The findings show that there is no shortage of interest in assessing EGOV initiatives. However, the supply side of EGOV initiatives is the dominant perspective being assessed, particularly by regional and international organizations. While there is an increasing interest in assessing the users' perspective (demand side) by individual countries, such attempts still seem to be at an early stage. Additionally, the actual use and impact of various EGOV services and activities are rarely well identified and measured. This study represents a stepping stone for developing instruments for assessing EGOV initiatives in future works. For the current stage, the study presents several general suggestions to be considered during the assessment process.

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## CCS CONCEPTS

- Applied computing ~E-government
- General and reference ~Evaluation

## KEYWORDS

e-Governance, e-Government, assessment, evaluation.

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## 1 INTRODUCTION

Digital government can be understood as the deployment of Information and Communications Technology (ICT) application and solutions with the aim of transformation and modernization various government functions, activities, policies, and interactions [1]. At the heart of such transformation, electronic governance (EGOV) has been introduced as the strategic use of ICT to support governance processes in which a government streamlines its operations, improves its administrative efficiency, offers suitable electronic services, and reforms its relationships with various stakeholders to increase integrity, transparency, and accountability of said government [2,3].

EGOV is assumed to be one of the key enablers to advance the efforts of countries towards the implementation of the United Nations 2030 Agenda and its 17 Sustainable Development Goals (SDGs) [4,5]. Globally, there is a growing interest to implement EGOV initiatives as a continuous process towards helping countries developing economic growth, political stability, social coherence and justice, and environment protection [5,6]. EGOV can, in fact, reinforce previous efforts through: (i) improvement of government performance and generating more cost-effective government operations; (ii) increase efficiency and effectiveness of electronic public service delivery; (iii) mitigate information asymmetry in the society; (iv) strengthen government interaction and relationship with several stakeholders; (v) enhance citizens' participation in decision-making process; and (vi) promote open, transparent, and accountable government and societies [2,4,7].

Despite these high expectations associated with EGOV, there is still a debate regarding the true success and impacts of EGOV initiatives, as the evidence of the existent impacts is somewhat mixed and limited [5,8,9]. It could be argued that governments face the issue of assessing and monitoring EGOV initiatives that are effectively able of measuring progress in the different aspects of EGOV [8,10]. Accordingly, a realistic assessment of EGOV initiatives seems quite important.

To do a realistic EGOV assessment is not, however, a simple and linear task. What is to be measured and assessed? How to measure and assess? When to measure and assess? These are fundamental questions that challenge those involved in EGOV measurement, assessment, and monitoring initiatives. Even more challenging is the creation of assessment instruments that could be applied in different countries, thus allowing for a cross-country comparison of EGOV development. The existence of a set of standard instruments for assessing different aspects of EGOV, which would be applicable in all countries, could be of extremely value for bolstering EGOV initiatives around the world. To help in this process of defining EGOV assessment instruments and conduct EGOV assessment, one fundamental initial step would be to have a comprehensive view of the current status of EGOV assessment or, in other words, to know which EGOV assessment initiatives are already been conducted and how they are conducted, either at international, regional or national level.

Therefore, the main purpose of this study is to identify and explore existing EGOV assessment initiatives. Our approach is thus driven by the following research question: How is EGOV assessment being conducted? The study aims at tackling this research question by identifying and analyzing EGOV assessment initiatives performed in five individual countries and seven regional/international EGOV assessment initiatives performed by different organizations that have been found through searching the Internet. In addition, the study also provides the results of a worldwide survey concerning EGOV assessment initiatives that was performed to complement the Internet searching.

The paper is structured as follows: Section 2 presents the scope and rationality of the study; Section 3 describes how the study was conducted; Section 4 examines seven international and regional EGOV evaluation initiatives; Section 5 explores how EGOV assessment is perceived and conducted at country level by presenting five national EGOV assessment initiatives and summarizing the general findings of a worldwide survey on National EGOV Assessment Initiatives directed to 193 countries; Section 6 discusses several general suggestions distilled from the international, regional, and local analysis conducted in previous sections; finally, Section 7 concludes the paper, underlines some study limitations, and advances future research steps.

## 2 SCOPE AND RATIONALITY OF THE STUDY

Measurement, assessment, and monitoring seem to be fundamental activities in any context of activity.

Rationally, “if you cannot measure it, you cannot improve it”. In fact, EGOV assessment initiatives can help and allow governments to measure the progress and achievement of EGOV initiatives, identify strengths to be supported, identify problems

or shortcomings to propose appropriate courses of action, and chart prospective directions and priorities [4,7,11,12].

Reasonably, to follow up on EGOV progress, systematic assessment processes are needed, including clear frameworks, procedures, and specific indicators. A lack of consistent and holistic frameworks including clear indicators and measures for assessing EGOV initiatives obstructs agreement on how best to measure and assess EGOV initiatives [1,13,14], which in the end hinders distilling lessons learned, integrating course corrections, and sharing best practices for EGOV development between countries. Furthermore, the importance of establishing coherent EGOV assessment lays in the assumption that different measurement tools used may provide inaccurate assessment. So, different measurement tools will not allow for international comparisons to be made, as well as prevent comparability over time within countries. Consequently, there is an opportunity for those who are interested in EGOV initiatives to advance global efforts and to significantly contribute towards formulating EGOV assessment frameworks and instruments.

Also rationally, “you cannot measure what you cannot define”. Therefore, a prerequisite for exploring EGOV initiatives is to define the meaning of EGOV.

The concept of EGOV has been in circulation for more than a decade. In literature, there are many definitions of EGOV [15]. The majority of these definitions are compatible rather than contradictory to each other, and exhibit common themes and shared threads. The study adopts Estevez and Janowski [6] definition of EGOV as “the application of technology by government to transform itself and its interactions with customers, in order to create impact on the society” [6].

It should be noted that there is still unclearness between the concepts of EGOV and electronic government (e-Government). Both concepts are often used interchangeably or synonymously [15,16]. While a detailed discussion of differentiations between both concepts is beyond the scope of this paper, several publications pointed out such differences [1,6,13,15-18]. Based on those publications, it could be concluded that while e-Government concerns to the application of ICT to administrative government functions and public service delivery, EGOV involves these aspects plus enhance the convergence of society for more participation and information sharing through encouraging citizen participation in decision-making processes and making government more open, accountable, and transparent.

Accordingly, this study considers EGOV as the application of ICT by government for: (i) facilitating internal government operations and administrative reform; (ii) improving government electronic public service quality and delivery that respond to the needs of citizens and businesses; (iii) strengthening the relationship of a government with its different stakeholders (citizens, civil society, non-government organizations, and the business sector); (iv) increasing citizen participation in decision-making processes; (v) reinforcing goals of making government more open, accountable, and transparent; and (vi) supporting the reach of “shared or participatory society”. This EGOV perspective clearly covers several initiatives implemented by governments,

namely; e-Government, e-Participation, e-Democracy, Open Government, and information society orientation initiatives.

### 3 STUDY DESIGN

This study is exploratory in nature. Exploratory research is often used to clarify and define the nature of the research problem in hand and it often leads to future studies, either by setting the grounds for further investigation or by prompting the formulation of new research questions [19,20]. Exploratory research frequently involves qualitative methods, which comprise one or more data collection methods, such as document analysis and review of published reports and information from organizations databases (secondary sources), and/or interviews, questionnaires, and direct observation (primary sources) [19,20]. For this study, secondary and primary data was collected based on desktop research and on a survey using a questionnaire.

Secondary data was collected through a desktop research of available EGOV assessment observatories or initiatives, found by a process of Internet searching. The initiatives were identified through searches conducted on Google's search engine by combining the keywords "E-Governance" and "E-Government" with "Assessment", "Evaluation", "Framework", and "Monitor". The aim of this search was to identify the overall set of existing EGOV assessment observatories and initiatives, either at an international, regional or national level, and independently of (i) the object of assessment considered, (ii) the kind of assessment produced (be it either a ranking, a benchmarking, a characterization, etc.), and (iii) the kind of institutions conducting the assessment (i.e., governmental institution, international institution, research institution, academic institution or private institution).

To ensure that a comprehensive set of initiatives and observatories would be found and analysed in this study, the desktop search effort was complemented with a worldwide online questionnaire delivered to government officials responsible or at least familiar with EGOV initiatives development and/or assessment (primary data), in the 193 countries that are part of the list of countries used by the Statistics Division of UNDESA (<https://publicadministration.un.org/egovkb/Resources/Country-URLs>).

This questionnaire served two main purposes. On the one hand, to identify national EGOV assessment initiatives that governments are conducting at country level that may not have been discovered during the desktop search performed. On the other hand, the questionnaire would also allow to gather additional information about: (i) what EGOV aspects are countries assessing; (ii) who is/are the entity/entities leading EGOV assessment initiatives in each country; and (iii) which EGOV aspects do respondents consider that should be measured/assessed.

The questionnaire, very short and containing basically open-ended questions, was implemented using the Lime Survey platform. The original version of the questionnaire was written in English. Given the fact that the survey had an international scope, the questionnaire was translated into the remaining official languages of the UN, namely Arabic, Chinese, French, Russian,

and Spanish. The data collection took place between 18 October 2017 and 20 November 2017.

The survey prospected respondents have been identified through browsing the list of official government portals worldwide used by UNDESA, as well as personal contact lists of the team researchers. As this was an exploratory study, some countries have received more than one invitation based on available contacts. Accordingly, 273 invitations to participate in the survey were sent out. A total of 33 responses were received. From those, 12 responses were discarded because they were uncompleted. For three countries (Angola, Brazil, and the Netherlands) two responses were received and have been merged. Consequently, 18 usable responses were accepted for data analysis. Next sections 4 and 5 present the findings from the desktop research and from the survey.

### 4 INTERNATIONAL AND REGIONAL EGOV ASSESSMENT INITIATIVES

This section discusses the findings related to some of the most well-known regional and international EGOV evaluation initiatives that were found through the desktop research, namely the *UN E-Government Survey and Knowledge Database*, the *EU E-Government Benchmark*, the *Waseda-IAC International Digital Government Ranking*, the *OECD Digital Government Transformation*, the *World Bank Open Data Readiness Assessments*, the *WWW Foundation Open Data Barometer*, and the *OKN Global Open Data Index*.

The discussion presented focuses on examining such initiatives based on their scope and coverage, measurement frameworks applied, assessment tool, type of data collected, approach and methodology followed. It also highlights some observed strengths and limitations of these initiatives.

#### 4.1 UN E-Government Survey and Knowledge Database

The UN E-Government Knowledge Database is an interactive online observatory, created and managed by the Division for Public Administration and Development Management (<https://publicadministration.un.org/egovkb/enus/#.W1eAMryWbIU>). This observatory provides free of charge access to all editions of the UN e-Government survey (2003 to 2016).

The UN E-Government Survey aims to support policy makers in shaping and strengthening their e-Government programs. The survey, which is carried out every two years, measures governments' capacity and effectiveness to use ICT to deliver public services, which reflects on how a country is using ICT to promote access and inclusion of its people.

The UN report ranks a total of 193 countries based on the EGDI index. The EGDI is a composite index based on the weighted average of three normalized indices in the following way: one third is derived from the telecommunication infrastructure index (TII), which is based on data provided by the International Telecommunications Union (ITU); another third is derived from the human capital index (HCI), which is based on data provided

by UNESCO; and the last third is derived from the Online Service Index (OSI). The OSI is based on data collected by an independent experts' survey questionnaire conducted under the supervision of UNDESA. The survey focuses on a set of features related to online service delivery, open government data, and e-Participation. The main element of the evaluation process is an extensive assessment of countries' official e-Government portals and other related websites of ministries or departments. The websites are assessed by at least three experts (two local researchers and a senior researcher that reviews the assessment done by the local researchers).

This survey focuses on the supply side analysis, as it examines e-Government features available on the national portals and related websites, clearly neglecting the demand-side. Additionally, the UN eGovernment ranking is purely measuring e-Government portals and the number/types of e-Government services, rather than assessing the actual use of such services by citizens and business.

Although the methodological framework has remained consistent across the different editions, its components have been updated to reflect emerging trends of e-Government strategies (e.g., advancement of mobile service delivery, use of social media, and open government data for promoting effective transparent and accountable government), changes in technology (e.g., internet of things, big data, and cloud computing), evolving knowledge of best practices in e-Government, as well as new indicators for telecommunications and human capital indices.

## 4.2 European Union E-Government Benchmark

The European Commission Directorate-General of Communications Networks, Content and Technology regularly conducts a study on the state of play of e-Government services across Europe (<https://ec.europa.eu/digital-single-market/>). Known as the *EU eGovernment Benchmarking*, this study aims to measure the performance of the public sector across European Union member states and other European countries. The study focuses on examining trends, issues, innovative practices, challenges, and opportunities of e-Government development across Europe.

The 14 reports (including eGovernment Benchmarking background and insight reports) that have been published so far provide up to date information on the advancement of e-Government in European countries and suggest further actions to overcome potential gaps. The reports also promote standards and guidelines for future and ambitious implementation of eGovernment services.

The benchmark studies conducted follow a method called "Mystery Shopping". A mystery shopper is trained to act as a prospective user to observe and measure a given public service process. To ensure reliability and professionalism each mystery shopper follows a detailed and objective evaluation checklist.

The assessment done follows the "eGovernment Benchmark Framework". This framework has evolved over the years in order to keep up with the "European e-Government Action Plans" priority areas, as well as with technological and organizational

developments. The current version of the framework, in use since 2016, has been developed to implement the European e-Government action plan (2016-2020). For this reason, its dimensions or indicators are clearly evolved and structured in line with the main priority areas included in the eGovernment action plan, which are: (i) modernize public administration with ICT; (ii) use key digital enablers; (iii) enable cross-border mobility with interoperable digital public services; and (iv) facilitate digital interaction between administrations and citizens/businesses for high-quality public services. The progress in these areas is measured via top-level benchmarks, user-centric government, transparent government, cross-border mobility, and key enablers. The strong alignment that exists between the framework dimensions and the plan areas ensures a more adequate measurement of progress of e-Government service in such areas.

Similarly to the UN e-Government Survey, the EU study focus on the supply side of online e-government services. The study examines the quantity and quality of e-Services but in a government perspective, leaving other opportunities to explore the demand side. The study considers both citizen and business perspectives, since the evaluation process of online service offered by government covered tracks services offered to both citizens and businesses.

## 4.3 WASEDA-IAC International Digital Government Ranking

The Institute of e-Government at Waseda University, Tokyo, in cooperation with the International Academy of CIO (IAC), has performed its e-Government ranking for the first time in 2005. The Waseda-IAC International e-Government ranking aims to address the progress of e-Government development, to identify new trends on e-Government development, and to share best practices among participating countries (<http://www.e-gov.waseda.ac.jp/>). So far, 65 countries included in the ranking and 13 annual rankings reports have been issued.

The Waseda-IAC ranking and evaluation indicators (benchmarking) were continuously evolved and improved to fit the current development and applications of ICT in public sector and respond to the new challenges of e-Government implementation. A recently-introduced change was to reflect the transformation from e-Government to digital government, as a perspective which covers more comprehensive government activities. Accordingly, the Waseda-IAC ranking defines and uses a set of comprehensive parameters, which include 10 indicators; (i) network preparedness/digital infrastructure;(ii) management optimization; (iii) online service/applications; (iv) national portal/homepage;(v) government chief information officer; (vi) digital government promotion; (vii) e-participation and digital inclusion; (viii) open government data; (ix) cyber security; and (x) the use of emerging ICT.

Besides containing a relatively comprehensive set of indicators for benchmarking, the Waseda-IAC also focuses on new trends in e-Government development, such as internet economy, cloud computing, big data, social media, internet of things, and cyber security. Further, the ranking considers the relationship between

governments and their stakeholders and highlights the importance of Government Chief Information Officers (GCIOs).

#### 4.4 Digital Government Transformation Organization for Economic Co-operation and Development

The Organization for Economic Co-operation and Development (OECD), specifically its internal Directorate for Public Governance and Territorial Development, aims to assist its 35 Member States (besides other partner countries) in their efforts toward fostering digital transformation of the public sector. This digital transformation can be characterized as a shift from e-Government – the governments use of ICT, particularly the Internet, as a tool to achieve better government – to digital government – the use of digital technologies, as an integrated part of governments' modernization strategies to create public value – in order to realize a fully developed, more open and efficient government and citizen engagement through digital government policies.

For such purpose, and particularly after 2014, OECD has been performing a series of digital government studies (in continuation of its previous studies series related to e-Government (2003-2013) (<http://www.oecd-ilibrary.org/governance/oecd-digital-government-studies-24131962>). Such studies promote the exchange of experiences, knowledge and best practices regarding digital transformation, contributing to social, economic and environmental development.

The digital government studies are based on analytical frameworks for digital government, for open government data, and for a data-driven public sector developed by OECD based on the 2014 OECD Recommendation of the Council on Digital Government Strategies. The OECD recommendation includes twelve key principles grouped in three main pillars: (i) openness and engagement pillar, embracing four principles: openness, transparency and inclusiveness, engagement and participation, creation of a data-driven culture in the public sector, and protecting privacy and ensuring security; (ii) governance and coordination pillar, encompassing four principles: leadership and political commitment, coherent use of digital technology across policy areas, effective organizational and governance frameworks, and strengthen international co-operation with other governments; and (iii) Capacities to Support Implementation pillar containing four principles: development of clear business cases, reinforced ICT project management capacities, procurement of digital technologies, and legal and regulatory framework.

To measure a given country progress in implementing the OECD Recommendation, the OECD Directorate for Public Governance and Territorial Development conducts two surveys on Digital Government Performance and on Open Government Data across OECD member countries and two partner countries.

The survey on Digital Government Performance aims to investigate progress on governments' performance on the digitization of the public sector. The survey focuses on eleven digital government transformation areas: ICT strategies, digital

rights and obligations, governance, ICT project management, ICT business cases-methods for measuring the value proposition, financial benefits for the central government, financial benefits outside of the public sector, HR strategy to develop ICT-skills in government, ICT procurement, online service delivery and transaction costs, and using national online portals.

The Open Government Data survey focuses on three main aspects of open government: open government data policies and governance framework, open government data implementation, and open government data impact. The survey benchmarks OECD countries and partners by using the OECD Open Useful and Reusable Data Index.

The data collection for both surveys is gathered through an online questionnaire delivered to government officials, predominantly chief information officers. The results of both surveys are limited to central/federal governments and exclude digital government and open government data practices at the state/local levels.

#### 4.5 Open Government Assessment

Three main assessment initiatives related with open data were found. Each one of them is described in the following sections

##### 4.5.1 World Bank Open Data Readiness Assessment

The Open Data Readiness Assessment tool (ODRA), developed by the World Bank (WB), is a diagnostic and planning tool aimed at helping governments to design and implement open data initiatives. (<http://opendat toolkit.worldbank.org/en/odra.html>), by providing qualitative data and action-oriented recommendations. ODRA focus on an open data readiness assessment tool and initiates consultative dialogue among relevant stakeholders regarding open data.

ODRA is based on experts' evaluation of several dimensions that may have impact on open data initiatives, namely: senior leadership; policy/legal framework; institutional structures; responsibilities and capabilities within government; government data management policies and procedures; demand for open data; civic engagement and capabilities for open data; funding an open data program; and skills infrastructure. Within each dimension, the assessment considers a set of indicators or questions. The examiners (experts) are a joint team of WB experts, experts from the country to which the open data initiatives belong to, and experts from other national and international donor agencies, such as the United Nations Development Program.

The ODRA tool is available free of charge to adapt and use. WB also offers an ability for countries worldwide to request the involvement of WB to perform an assessment study. From 2013--2016, 13 countries conducted open data readiness assessment studies in collaboration with the WB. The WB website offers a full report, including the results of such studies in different languages, namely in English, French, Russian, and Spanish.

##### 4.5.2 Open Data Barometer (ODB)

The Open Data Barometer (ODB), run by the World Wide Web Foundation, assesses governments efforts and performance in

fulfilling the open data principles. These principles mandate that data should be: open by default, timely and comprehensive, accessible and usable, comparable and interoperable, improve governance and citizen engagement, and it should be for inclusive development and innovation (<http://opendatabarometer.org>).

To fulfil such purpose, ODB produces a yearly global measurement of how governments are publishing and using open data for accountability, innovation, and social impact. Thus, the Barometer ranks governments based on a framework that consists of three major dimensions, each containing several sub-indices. The first dimension is “readiness of governments for open data initiatives”. The data for this dimension is taken from the World Economic Forum, WB, United Nations e-Government Survey, and Freedom House. The second dimension is “implementation of open data by governments”.

The implementation assessment process covers open data quality of 15 kinds of data in each country (mapping data, land ownership data, national statistics, detailed budget data, government spend data, company registration data, legislation data, international trade data, public transport timetable data, health sector performance data, primary and secondary education performance data, crime statistics data, national environmental statistics data, national election results data, and public contracting data). Finally, the third dimension is “impact of open data on citizens’ life” and is related with what impact is open data having on social, politics and economic. For implementation and impact dimensions, a peer reviewed expert survey containing a range of questions about open data contexts, policy, implementation, and impacts is used.

The 2016 ODB ranking assessed and ranked 115 countries. The ODB website provides features to sort all surveyed countries. All editions reports are free of charge and available to download in three languages: English, French, and Spanish.

#### 4.5.3 Global Open Data Index (GODI)

The Global Open Data Index (GODI) is the annual global benchmark for the openness of government data, managed by the Open Knowledge Network (OKN) (<https://index.okfn.org/>).

The primary idea of this index is to assess how are governments around the world publishing open data. To reach such aim, the index assesses open government data in 15 thematic areas considered relevant for civil society (government budget, national statistics, procurement, national laws, administrative boundaries, draft legislation, air quality, national maps, weather forecast, company register, election, results, locations, water quality, government spending, and land ownership). GODI assesses these 15 areas based on several indicators: available online, open-licensed, machine-readable, available in bulk, and available free of charge. GODI methodology is based on crowdsourcing data collection, meaning that anyone can review and submit its evaluations, which should be provided with some qualitative justifications. To validate the crowdsourcing evolutions, the inputs are reviewed by a team of professionals from OKN. GODI does not look at other aspects of the common open data assessment framework such as use and impact. Further, no recommendations or improvement actions are suggested.

## 5 NATIONAL EGOV ASSESSMENT INITIATIVES

The most widely known international EGOV assessment initiatives were describe in the previous section. Those initiatives assess and compare EGOV in multiple countries. In this section, the focus is on exploring how EGOV assessment is perceived and conducted internally (at a national level) by countries. The section starts by presenting five EGOV assessment initiatives – for Norway, Germany, India, Saudi Arabia, and United Arab Emirates –, which were identified during the process of desktop research. General findings of a worldwide survey on national EGOV assessment initiatives are presented in the second part.

### 5.1 National EGOV Assessment Initiatives Identified through Desktop Research

#### 5.1.1 *The Agency for Public Management and eGovernment (Difi), Norway*

The Agency for Public Management and eGovernment (Difi) (<https://www.difi.no>) drives and oversees the implementation of the digital government strategy in Norway. As part of the controlling and monitoring process, Difi monitors the progress of the digital government strategic plan and plays key advisory, audit, and technical roles when Norwegian’s public sector institutions seek and subcontract consultation or advice services from private consultation firms.

Difi distributes statistics and directs annual reviews of public digital services and websites using an evaluation instrument called “Quality Web Project”. This instrument includes 33 well defined indicators that cover six perspectives of analysis: (i) Website and services are easy to find; (ii) Website and services are credible; (iii) Website and services are safe to use; (iv) Website and services work well; (v) Website and services are easy to use for everyone; and (vi) It easy to get help. The instrument seems to follow a clear and rigorous process, as the testing indicators for each criterion are precisely set and well explained. This survey usually covers a large number of citizens’ experiences with public services (e.g., 11 567 randomly selected residents participated in the 2016 survey).

Further, Difi’s assessment initiatives are not only focused on citizens. Other reports concerning the status of digitalization in the public sector, of digitalization and change of administrative process, of open public data, and of employees’ satisfaction are also led by Difi.

Difi’s evaluation instrument, reports, and statistics information are free of charge available to download, but most of them only in Norwegian language. This could be understood as the evaluation process is designed for and focused on Norwegian public sector. However, it hinders the exchange and widespread of assessment practices between countries in a global scope.

#### 5.1.2 *EGovernment MONITOR, Germany*

EGovernment MONITOR initiative has been examining and assessing the current eGovernment situation in Germany since 2010 (<http://www.egovernment-monitor.de/startseite.html>).

eGovernment MONITOR aims at improving the acceptance and the design of e-Government online services by collecting information on user preferences and user behaviors. Since 2012 onwards, Austria and Switzerland were encompassed in the survey/report as analogue countries. eGovernment MONITOR draws up an annual report on the status appraisal of implementation of the eGovernment. The report is a result of a quantitative survey on the use and acceptance of e-Government services, privacy concerns, citizens' satisfaction, and e-Government drivers and barriers. The survey data collection typically uses computer-assisted web interview from around 3000 citizens among the three countries. The annual reports are free of charge to download but in German language only.

This initiative results from a jointly effort conducted by NEGZ (National E-Government Competence Center – [www.negz.org](http://www.negz.org)) and ISPRAT (Interdisciplinary Studies on Politics, Law, Administration and Technology – <http://www.isprat.net>). NEGZ and ISPRAT work to advance the modernization process of the public sector using ICT in federal, state and local governments.

ISPRAT project issued several reports for years 2007-2017. The project analyzes and characterizes the current situation of national and local EGOV initiatives in Germany and proposes recommendation toward effective implementation of those initiatives. The project assists and evaluates various aspects of EGOV initiatives, such as: government policies and strategies, open government data, mobile government services and applications, public e-services (use, design, and delivery), e-participation activities, and the exploration of emerging technologies such as cloud computing and Web 2.0 applications (e.g., social media) for public administration.

All NEGZ and ISPART reports are freely available online but in German language only. For this reason, it makes hard to promote international exchange of experience of administrative modernization and this may prevent sharing good practices for EGOV development between countries.

### 5.1.3 EGOV Assessment Initiatives, India

Under the “Digital India” program, which aims at transforming India into a digitally empowered society and knowledge economy, several initiatives have been taken for the growth of EGOV in the country. The implementation, coordination, and monitoring of EGOV project/initiatives are mandated to Ministry of Electronics & Information Technology (MeitY).

As part of its assessment strategy, MeitY has been assessing EGOV projects across India to understand their impact and effectiveness across projects and across implementation geographies (<http://meity.gov.in/content/assessment-e-governance-projects>). For such purpose, an assessment framework has been developed and continuously improved, and customized to each project.

The assessment framework consists of four major dimensions, each comprising several indicators. The dimensions are: cost of service, quality of service, quality of governance, and overall assessment. Based on such assessment framework, two main assessments initiatives were conducted, one in 2007-2008 and

other in 2009-2010, covering several national and state-level EGOV projects. The 2007-2008 initiative comprised the assessment of three national-level projects using a survey of 7000-9000 citizens and the assessment of three state-level projects across thirteen states. A total sample size between 600-800 citizens per state was used in these state-level project assessments. This state-level assessment was based on a survey using a control and a treatment group (i.e., users who have experienced manual system and users who have experienced the computerized system). The 2009-2010 initiative comprised two impact assessments, covering four urban local bodies and five states, as well as one baseline assessment initiative in other five states. Currently, five assessment studies on EGOV initiatives are being carried out using a revised version of the assessment framework.

DeitY has also institutional linkages with the National Informatics Centre (NIC) for management and monitoring EGOV projects through ensuring the sharing of standards, information, and seamless interoperability of data. The DeitY and NIC reports provide a wealth of information on various assessments aspects and on guidelines of EGOV initiatives. The assessment types considered, and the methodology used, give reasonable and adequate consideration to the assessment of EGOV projects that are either at an early stage of implementation or after a period of its execution. Additionally, several reports by NIC follow a qualitative approach, rather than relying only on the typical statistics, showing successful cases and discussing good practices.

### 5.1.4 E-Government Transformation Measurement, Saudi Arabia

The Saudi Arabia's e-Government program “YESSER” has launched an evaluation project called “e-Government Transformation Measurement”. The project aims to evaluate the factual status of government entities related to e-Government transformation. ([https://www.yesser.gov.sa/EN/Transformation\\_Indicators/transformation\\_measurement\\_mechanism/Pages/about\\_measurement.aspx](https://www.yesser.gov.sa/EN/Transformation_Indicators/transformation_measurement_mechanism/Pages/about_measurement.aspx)). For this purpose, a framework has been developed. This framework comprises four measurement phases of e-services development, namely the Building Phase, the Availability Phase, the Excellence and Enhancement Phase, and the Integration Phase.

YESSER program has developed a very specific methodology to be executed through the different phases of application. The agency which completes the requirements of a measurement phase moves to the next phase and so on. Each phase of the framework considers specific themes and indices as follows: the Building Phase includes themes such as enterprise setup of the e-Government, technology structure, informational environment, and e-services provided; the Availability Phase includes themes such as impact, electronic empowerment, and e-services made available by agencies; the Excellence and Enhancement Phase includes transition pioneering, empowerment, and services quality; and finally, the Integration Phase includes three perspectives: (1) a structure perspective, which comprises elements that enable providing the required e-government services effectively; (2) a human resources perspective, which covers, on the one hand, the government employees “services

providers”, and, on the other hand, citizens or customers; and (3) a management perspective, which focuses on the elements of the “transaction procedures” needed, by including two themes: basic requirements and security requirements.

Since 2007, YESSER has carried out and managed seven measurement initiatives. Those initiatives have measured the transformation applications in more than 160 government agencies from most governmental sectors, e.g., health, education, finance, foreign and tourism affairs, transportation, environment and social affairs, military, and internal security. The measurement results are available on the website in Arabic and English languages.

#### 5.1.5 Smart Government Indices, United Arab Emirates (UAE)

UAE’s smart government indices project is overseen by the Telecommunications Regulatory Authority and the Prime Minister’s Office (<https://government.ae/en/information-and-services/g2g-services/measuring-the-kpis>). The project aims to strengthen UAE’s public sector through measuring the development of government electronic and mobile services. The measurement process is based on the definition of several indices. The indices focus on the level of public awareness, usage, and satisfaction of electronic/mobile services. The project suggests an online survey tool to be used by government entities. However, such survey tool is available only for government entities (it is not available to be viewed or to be free downloaded). Additionally, no information and publications (e.g., results or reports) were found regarding the assessment projects.

## 5.2 General Findings of the Survey on National EGOV Assessment Initiatives

This section presents the main findings from the questionnaire applied to collect data on existing national EGOV assessment initiatives in the 193 UN Member-states. The questionnaire was focused on (i) identifying the countries which have EGOV assessment initiatives, (ii) the official institution/organization responsible for assessing and monitoring EGOV, (iii) the EGOV aspects that are currently measured/assessed in each country, and (iv) what additional aspects not currently assessed should be considered in future assessments.

Responses were obtained from 18 countries: Afghanistan, Angola, Brazil, Cabo Verde, Denmark, Estonia, Finland, Germany, Ghana, Ireland, Latvia, the Netherlands, Norway, Oman, Pakistan, the Philippines, Portugal, and Slovenia. The analysis of the responses provided some interesting findings, summarized in next paragraphs.

**Finding 1:** The assessment and monitoring exercises of EGOV seem to be a priority for many countries. Survey results indicate that most countries have a ministry and/or single agency function/unit responsible for monitoring and evaluating the implementation and the progress of EGOV. Further, the majority of countries, except three (Cabo Verde, Ghana, and Pakistan) are currently implementing an evaluation projects to assess and to monitor EGOV initiatives.

**Finding 2:** Interestingly, EGOV assessment in several countries is no longer only responsibility of ICT ministries but are

mandated to ministries with development, management, and administrative modernization functions. For instance, Ministry of the Presidency and Administrative Modernization in Portugal, Ministry of Public Administration in Slovenia, Ministry of Planning, Development and Management in Brazil, Ministry of Economic Affairs and Communications in Estonia, and Ministry of Finance in Finland.

**Finding 3:** For the assessment process, general different approaches could be noticed. In some countries, such as Norway, assessment initiatives are performed by a centralized agency. In other countries (e.g., Denmark, Finland, and Portugal) the assessment is performed by a central agency in cooperation with other state departments. Countries such as Estonia, Slovenia and Oman mandated assessment initiatives to each public unit (service provider), to independently perform their own assessment initiatives, but still under supervision of a central agency. There are also countries that perform the assessment initiatives in collaboration with private research companies (e.g., Latvia) or with research institutions (e.g., Germany). Finally, in other countries, such as Afghanistan, the EGOV assessment is performed only when some collaboration is requested by international organization (e.g., World Bank).

**Finding 4:** While the majority of countries surveyed provide various type of statistics online, reports and studies, most of them are published in their official languages. Few have been found in English for example. This fact prejudices the sharing of assessment practices and experiences.

**Finding 5:** The assessment initiatives of classic e-Government services dominate the existent EGOV assessment initiatives (e.g., the level of online services provision, accessibility, usability delivery, quality, adoption, and satisfaction). It is notable that emerging efforts to assess other EGOV aspect such e-Participation and open government data are still lagging.

Several respondents highlighted the need to assess other EGOV initiatives such as the awareness of online service applicability (Latvia), user involvement (the Netherlands), levels of usage and maturity of e-services (Finland and the Netherlands), the adoption of mobile services and cybersecurity (Oman), open data initiatives (Oman and Brazil), and indicators of efficiency and effectiveness (e.g., transactional costs) (Denmark). Respondents also stressed the need to set global standardized assessments for user satisfaction (Slovenia and Pakistan) and the impact of EGOV initiatives on society was also an issue highlighted (Pakistan).

## 6 DISCUSSION

Assessment of EGOV initiatives constitutes a central issue for governments, since it can point policy makers and practitioners in the right direction. This may explain the increasing interest in assessing EGOV evidenced by countries as well as by international organizations and entities. Based on the analysis and findings presented in previous sections, some suggestions that may be considered when planning, designing and implementing EGOV assessment initiatives are presented in this section.



### 1) Toward more demand side perspective

As noted from the analysis, there is a great interest to assess the supply side of EGOV initiatives. Most of the initiatives found, namely the international assessments, are focused on this. But, the demand side of the equation requires further assessment as well. In fact, governments (who launch, develop, and implement EGOV initiatives) and users (i.e., citizens and businesses) are often in divided roles, creating a gaping hole between what is designed and provided and what are the really needs of citizens.

The UN and EU e-Government regular surveys and benchmark, for example, are wealth of information regarding e-Government services offered by countries worldwide. Without doubts, assessing the supply side is very significant but it does not, by itself, constitute or guarantee advanced e-Government development and adoption. The real users' awareness, willingness, ability, actual usage, expectations, needs and preferences should be considered and precisely measured. Hence, further efforts dedicated to assessing the demand side seems convenient.

The lack of demand side perspective in the assessment process of open government is also clear from the initiatives analyzed. The supply side is the focus of assessment in international efforts such as ODRA, ODB, and GODI, which assess, evaluate, and rank open government data globally. In these studies, the assessment was mainly based on the availability and accessibility of data. While this is important, the fact is that data on its own have no value. The added value of open data comes when people became aware, able to access, and use it. Hence, developing an assessment instrument that takes in consideration the actual data use from users' perspectives (i.e., citizens, private or business sector, civil society organizations, academics, and researchers) is needed.

It is worth mention that, while the international benchmarks focus basically on the supply side, there is evidence that, at an internal level, countries tend to consider the demand side in their assessments, as noticed in Norway, India, Germany, and Latvia.

### 2) Capturing EGOV initiatives impact

As mentioned above, [6] define EGOV as "the application of technology by government to transform itself and its interactions with customers, in order to create impact on the society". Certainly, by this view, EGOV initiative is not an end into itself but rather a means to achieve goals and to cause wide-range societal impacts. Thus, the assessment process should not only focus on EGOV adoption and usage but also on the impact it may cause at social, economic, environmental, and political levels in terms of making government more participatory, improving efficiency and effectiveness of government operations, reinforcing economic status, and increasing democracy. Overall, linking EGOV assessment with the realization of the SDGs would be a significant approach. Accordingly, more assessment efforts should focus on evaluating the prospected impact from that usage of EGOV activities either from demand side by the targeted stakeholders (i.e., citizens and firms) or from supply side by experts, for example.

### 3) Multiplicity of stakeholders and diversity of assessment techniques

The study suggests that, whether the EGOV assessment process focuses on supply or demand sides, it has to consider various evaluation methods and allow various stakeholders to contribute to the assessment initiative. From the supply side, the inclusion of e-Government experts (e.g., academics, researchers) to assess the appropriateness and the quality of EGOV activities offered by a country would give significant insights. The experts probably have more advanced experience that allows them to perform subjective evaluation and suggest further improvements. From demand side, experts, businesses, and non-government organization, besides citizens, should be considered when assessing the quality of EGOV. Latvia constitutes a good example at this level, by considering experts' and businesses' perspectives in assessing the quality of e-Government services. Additionally, while surveys and quantitative methods are the most frequent assessment methodologies, qualitative approach including, for example, interviews, focus groups and experts' panels seem significant to advance EGOV assessment and propose enhancement practices. Adopting qualitative assessment techniques allow governments to receive not only more feedback on implementation, impact, and overall evaluation of EGOV initiatives, but also to receive a different kind of feedback, that may be very useful for understanding the reasons and justifications beyond certain behaviors and results achieved or not achieve with EGOV. OECD recent reviews on digital government in Norway, for example, complement quantitative approach with interviews of Norwegian stakeholders from the public sector. In fact, OECD stress the importance of combine quantitative and qualitative measures to assess the supply side of EGOV [21].

### 4) Targeting disadvantaged and vulnerable groups

As EGOV implementation targets all segments of society, similarity EGOV assessment should ensure that all segments of society are offered equal chances to participate in the assessment initiatives, especially women, youth, people with disabilities, people living in poverty, and people who live in rural areas. In fact, this reinforces efforts for bridging digital divide and realizing gender equality.

According to the 2013 ITU Report, on Measuring the Information Society, digital divide generally reflects the gap among various social groups ability to access and use technology, typically by gender, socio-economic levels, race, and geographic areas. Further, the SDGs underlined in the UN 2030 agenda emphasize the needs for realizing gender equality and the empowerment of women and girls. According to the UN 2030 agenda, those groups must have equal opportunities to access and use technology as men and boys. The UN agenda also stresses that people who are vulnerable must be empowered. Vulnerable groups include elderly people, people with disabilities, migrant workers, minority groups and refugees. Following the "leaving no one behind" principle adopted by the UN for offering suitable e-services, the EGOV initiatives assessment process must consider and cover all segments of society without distinction of any kind as to race, sex, language, religion, location, national or social origin, property, disability or other status. In thus, EGOV assessment processes that would focus on citizens' perspective

should consider those vulnerable and disadvantage groups. It is believed that such approach will offer more insights to reinforce more actions toward responding to their needs and empower them to contribute to policy making and public services.

## 7 CONCLUSIONS, LIMITATIONS AND FUTURE WORKS

This study analyzed and reviewed several worldwide international and national EGOV assessment initiatives. The analysis was based on data obtained from desktop research and from a multilingual questionnaire sent to the 193 countries that are part of the list used by the Statistics Division of UNDESA.

The study analysis provided a better sense of the *status quo* and progress being made by countries and international organizations in terms of EGOV assessment initiatives as well as unveiled some major challenges faced in these processes.

The study analysis confirms the complexity and interdisciplinarity of the assessment process of EGOV initiatives that results from the complexity of EGOV in itself. That is, EGOV contains several aspects, involves several stakeholders as well as involves complex relationships between technological, human, legal, regulatory, and administrative dimensions. Further, each EGOV initiative has its own target groups, and different prospected impacts depend on the context and the overall goal of the initiative.

The findings stress the crucial need for creation of an effective framework/instrument for assessing EGOV development and achievements from demand side considering various EGOV stakeholders' perspectives (e.g., citizens, business sector, and civil society organizations). Additionally, findings also emphasize the need to consider vulnerable and disadvantage segments of population (i.e., women, people in rural area, and people with disabilities) in the assessment processes.

As it is widely acknowledged, exploratory research is not typically intended to provide conclusive evidences, generalizable to the population at large. Instead it mainly aims to provide a general insight into a given problem/situation [19,20]. Even considering this, and despite the findings reached, this study has inevitably limitations. The reduced number of countries participating in the questionnaire (18 countries of 193 enquired), as well as the quite limited number of international and particularly national EGOV assessment initiatives reviewed, may weaken the findings achieved. We believe that additional EGOV assessment initiatives, not reported in this paper, are being conducted in other countries. Therefore, the results presented can be essentially seen as indicative, since the initiatives analyzed may not be necessarily representative for the world as a whole. Nevertheless, the information provided is effective in laying as an essential first step and groundwork for later studies to be conducted.

Accordingly, the next logic step for this study will be to pursue the identification and analysis of new national EGOV assessment initiatives, so that we can develop a more comprehensive perspective of who is measuring EGOV, what is being assessed, and how EGOV is being assessed. Later, a set of focus groups and

expert interviews with different stakeholders will be conducted, with the aim of identifying a set of measurements or assessments that relevant stakeholders consider should exist. Grounded on all these contributions, a framework for EGOV assessment will be proposed and specific assessment instruments to measure and assess EGOV, in different perspectives and at different levels of government, will be developed under the scope of this framework.

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