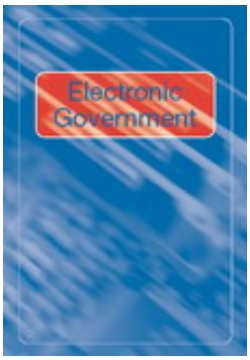

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Measuring governments' online accountability

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Measuring governments' online accountability

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Abstract: This paper aims to propose an electronic accountability index of information disclosure on the web – named e-accountability index (e-AI). In particular, the methodology used to develop the e-AI, based on seven areas of the Global Reporting Initiative (GRI) survey, is described and explained. The application of the index is then illustrated using central government websites of the 12 South American countries, often referred to as not discharging enough accountability. The e-AI scores can be recorded for different countries that may be, therefore, ranked accordingly. This research contributes by developing an important index of electronic accountability that takes into account the standards of good governance and the accessibility and usability of each government's website, to improve the disclosure of information and evaluate their level of accountability in a comparative-international perspective.

Keywords: accountability; accessibility; usability; index; central governments; South America.

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1 Introduction

The adoption of information and communication technologies (ICTs) has caused a considerable change in the relationships between central governments (CG) and different stakeholders (Osborne and Gaebler, 1992), including citizens. This modernisation has been promoted through initiatives such as websites for public sector entities (Dunleavy and Margetts, 2002), social *media* tools, social networks, online meetings, and public feedback on public policies, all of which have a main role in enabling greater transparency and accessibility concerning public sector information (Jaeger and Bertot, 2010). CG transparency in websites facilitates analyses of information about internal work, decision processes and procedures (Pina et al., 2009) ultimately supporting democracy and good governance.

Regarding data in CG websites, it is interesting to analyse how easy it is for citizens to find the appropriate information within the websites, considering the time and the number of clicks needed to reach it. The concept of accessibility refers to the easiness with which different stakeholders can access website information; it may be judged based on whether the information is visible, or access is denied (e.g. with a password), or whether information is deliberately hidden. Additionally, usability is understood as the adroitness of use of CG webpages by users.

This study analyses prior literature and collects data based on 75 questions of the Global Reporting Initiative (GRI) survey, which classify and define seven different dimensions used to assess CG accountability (strategy; organisation profile; information

parameters; government, undertaking and stakeholders; economic indicators; social indicators; environmental indicators). The GRI guidance was selected as it is objective and value-neutral, improving both relevance and comparability of the index to be developed (Angluin and Scapens, 2000).

Research on performance indicators published in governments' websites evidences that these are analysed to value citizens' views about improvement of governments in accountability (Scott and Meijer, 2016; Lewis, 2019). In fact, recent papers have identified the usefulness of government financial statements to report on the sustainability of public policies. Specifically, Guerrero-Gómez et al. (2021) show an analysis of the disclosure of online information on sustainability with respect to the countries of Latin America.

However, there are very few studies that assess governments' accountability at an international level, and even fewer in the South America (SA) region (Ndire, 2020). On the other hand, it is necessary to ensure that those actors making decisions and delivering public services at a country's level are accountable in an open manner, and public services might be better delivered through e-government (Dunleavy and Margetts, 2002; Wong and Welch, 2004; Torres et al., 2005, 2006; Azam et al., 2013) with IT aid (Caba et al., 2005, 2008; Hermosa et al., 2019). Nevertheless, there is still no accountability index proposed as a holistic and standardised measurement tool for CG. This paper aims at contributing to fulfil this gap, as it derives a new model to measure accountability in countries CG, diagnosing its true level and demonstrating progress or setbacks it may have.

Accordingly, the main objective of this paper is to develop a measure of governments' electronic accountability – named e-accountability index (e-AI), considering the information disclosure in terms of the GRI items, in the public sector, more specifically in CGs. The proposed model facilitates stakeholders to observe, compare and analyse the information disclosed by CGs, to improve accessibility and usability for citizens and management of accountability overall. As an example, this index will be applied to the South American CGs.

Therefore, the research question defined is: How can central governments' online accountability be measured, considering website and accessibility dimensions?

This analysis also contributes in methodology to earlier research. Although having considered models such as those presented in Lourenço et al. (2013) for the scoring scheme, Pina et al. (2009) to measure usability, and Alcaraz-Quiles et al. (2018), Navarro-Galera et al. (2016) and Hermosa et al. (2019) to measure GRI items disclosure and accessibility, these models were taken further, bringing together all these variables to analyse accountability in CG. The proposed index may be used by academics and especially by governing authorities, to rank countries' level of accountability around the world.

The paper is organised as follows. First, a literature review is presented about accountability measures, where the accessibility and usability contexts are separately considered. Then, the methodology is explained. Next, an application of the index to the SA countries is presented together with these countries' ranking. Finally, conclusions and implications for future policy and research are summarised.

2 Accountability, accessibility and usability concepts

In the modernisation process of the public sector a key concept is accountability, which can influence the success of public administration reforms. However, in many countries all around the world the study of accountability is recent, being a key issue for democratisation (Filgueiras, 2016). For that reason, ensuring government transparency and accountability is a priority for all governments. Academic literature (e.g., Lourenço et al., 2013) has highlighted transparency as a requisite towards accountability. Traditionally, transparency is a tool for external stakeholders to monitor the internal work of an organisation (Hood and Heald, 2006; Scott and Meijer, 2016).

The concept of accountability implies the responsibility for public institutions to report on the use of public resources and be receptive to citizens about performance targets (Florini, 2000; Hood and Heald, 2006; Bovens, 2007; Lourenço et al., 2014; Lourenço, 2015). Within the government context, 'accountability' is the used term referring to the principles for the construction of information openness, requiring citizens to be morally committed to the public good. Thus, accountability becomes constitutive of public practices of citizenship and political institutions forces.

As summarised by Filgueiras (2016), the idea of transparency is basic for the consolidation of the concept of accountability. This study shows that the concepts of transparency and accountability are closely linked, being transparency supposed to generate accountability (Armstrong, 2005; Fox, 2007). Wong and Welch (2004), in their study on website openness and accountability, highlight three attributes of accountability – transparency, interactivity, and openness. Lewis (2019) analyses, using the Australian Survey of Social Attitudes (AuSSA), the citizens' view about their government's accountability and management, through performance indicators published in their government's websites, as performance measurement can also be regarded as one aspect of accountability. Coy and Dixon (2004) deal with the perspective of an index for annual reports in New Zealand universities, considering eight categories for accountability index (timeliness, report overview, university overview, financial, general service, teaching service, research service, and community service). They developed the Public Accountability Index (PAI) from a public accountability perspective, using stakeholder opinions captured via a Delphi exercise, method relying on a panel of experts. The PAI was then applied to measure the annual reports of eight New Zealand universities in the period 1985–2000. Page (2004) examines four approaches to assess a collaborative capacity for accountability in ten USA states, considering two types of innovations that are increasingly common in public administration – accountability for results and interagency collaboration. This research found that the various approaches may help collaborators manage their stakeholders' expectations about their actions and accomplishments. Salas (2015) combines dimensions and instruments of accountability in an index for two ministries of Costa Rica, with a total of 81 items classified in six dimensions: four of internal control (classic legality economic form; management economy, effectiveness and efficiency; organisational structures, processes and staff; and judicial court of the administrative contentious and constitutional court) and two of external control (parliamentarian politic, economic and citizen attention; and external audit administrative bodies and consulting). The results showed a culture of little strengthened accountability.

IFAC's current research addresses the issue of accountability by focusing on portraying the state of governments' finances. Together with the Chartered Institute of

Public Finance and Accountancy (CIPFA), and the Zurich University of Applied Sciences, they have developed the 'International Public Sector Financial Accountability Index' (IFAC, 2018). This qualitative index focuses on federal/central governments and considers two basic aspects: the accounting basis, which provides an accurate picture of the extent of accrual accounting and the adoption of International Public Sector Accounting Standards (IPSAS) globally, and the International Financial Reporting Standards (IFRS), which focuses on the quality of financial accountability information.

Furthermore, the literature shows that accessibility and usability are necessary characteristics in the information disclosed by the governments in order to make such information easily readable and measurable in regard to the relationship with accountability. As it was previously stated the concept of accessibility is defined in this paper as the time used for achieving the information disclosed in government websites based on whether the information is visible, or access is denied, or whether information is deliberately hidden. Further, this concept refers to the ease with which different stakeholders can get information from governments. Moreover, usability can be defined as the ease of use of governments' webpage by users. Accordingly, usability may be measured in line with Pina et al. (2007), embedding issues such as whether the Regional Governments webpage has a section for frequently asked questions, information in another language, a current news section or glossary terminology, for example. Thus, accountability represents the obligation for public officials to report on the usage of public resources and answerability of government to the public to meet the stated performance objectives (Armstrong, 2005; Lourenço, 2015).

All previous studies have been joined together to analyse accountability in CG in this research, which contributes by using 75 questions from the GRI questionnaire classified into seven dimensions. GRI can be considered relatively objective and value-neutral improving both relevance and comparability for the exchange of reliable and transparent information (Angluin and Scapens, 2000). Also, this survey is the most trusted and widely used tool in the world, helping businesses, governments and other organisations understand and communicate the impact of key aspects in sustainability reporting practices (IFAC, 2013, 2015, 2018). The proposed combined or global *e-accountability index* (e-AI) will further facilitate stakeholders such as academics, practitioners, policy makers and multilateral donors aid agencies, to observe, compare and analyse transparency of CG information, in order to improve accountability management and the access of information by citizens. Moreover, this e-AI may be applied using other information items.

3 Methodology and index development

In the past years, most studies carried out to measure e-government evaluated the efficiency of websites regarding certain features, such as the presence of designated information and the website design (Ingram and Gray, 1998; Rockville, 1999; Kerschot and Poté, 2001; Finger and Cotti, 2002; West, 2002; Lourenço, 2015; Hermosa et al., 2019). Accessibility to information and usability of CG websites are two closely related concepts and whilst usability implies accessibility, the contrary is not necessarily true. Therefore, both concepts have been considered important enough to be included in the

definition of the e-AI, as explained in the sections below (Huberman et al., 1998; Holzer and Kim, 2003, 2006, 2008).

We will start from Hermosa et al. (2019) research methodology. However, despite maintaining the GRI's seven dimensions (Appendix A), we add the accessibility and usability variables to create a more accurate online accountability index.

There are some local indexes (Coy and Dixon, 2004; Page, 2004; Pina et al., 2009; Ndire, 2020) and regional indexes (Alcaraz-Quiles et al., 2018) that put emphasis on online accountability (see Table 1).

3.1 Accessibility

Accessibility is defined as the time used for achieving the sustainable information disclosed in governments websites (Alcaraz-Quiles et al., 2018). It refers to the ease with which different stakeholders can get their hands on the information.

The term 'click' shows the number of steps web users must follow to look for disclosed information, through a press on the button of the computer mouse. Hence, many empirical surveys on web navigation use the click as a measurement value or accessibility norm (e.g., Huberman et al., 1998; Milic-Frayling et al., 2004).

Some experts (Zeldman, 2001; Blackmon et al., 2002; Kalbach, 2002; Ritter, 2002) insist on the importance of the availability of the information within a few clicks. The three-click rule (where it is supposed that most people give up after three clicks) considers a tolerance limit in the internet users (Bernard, 2002; Kalbach, 2002). However, other authors have a more elastic interpretation. In particular, Porter (2003) demonstrates that the three-click rule is not valid and that users may click up to 25 times until they find the information they want.

Taking all the information in the GRI questionnaire, the present research decided on a limit of 20 clicks, meaning that if the citizen needs more than 20 clicks to find the first page of information, that CG website is poorly accessible, being considered a less user-friendly website. Thus, the following quantitative scale has been defined:

a 1 point: if it takes less than 5 clicks to find the information searched by a citizen

b 0.75 points: if it takes 6 to10 clicks

c 0.5 points: from 11 to15 clicks

d 0.25 points: from 16 to 20 clicks

e 0 points: if it takes more than 20 clicks.

3.2 Usability

The usability concept has been considered by various authors (e.g., Holzer and Kim, 2003, 2006, 2008; Pina et al., 2009; Alcaraz-Quiles et al., 2018) to explain the digital evolution in websites to improve accountability to the general public.

Usability may be defined as the ease of use of governments' webpage by users. In this study we have used the model of Pina et al. (2009) to measure this variable.

Table 1 Previous research on accountability, accessibility, usability indexes

Authors	*Sample*	*Countries/entities*	*Level*	*Research objectives*	*Methodology*	*Name index*	*Variables*
Alcaras-Quiles et al. (2018)	The websites of 17 governments	Spain	Regional governments	Compare and analyse the transparency information of RGs	The GRI guidelines (based on 75 items), with four areas (strategic and general information, economic, social and environmental	N/A	The information disclosed of GRI, the level of accessibility, and the level of usability
Coy and Dixon (2004)	The annual reports (1985–2000) of seven universities	New Zealand universities	Local universities	Develop a index from a public accountability perspective using stakeholder opinions	This index uses via Delphi exercise	Public accountability index (PAI)	Report qualitative characteristics, overview: annual report, overview: university, service: community, service, general, service: teaching, teaching: process, teaching: output/outcome, service, research, financial
Pina (2009)	15 European Union countries	European Union countries	Local governments	Describes an empirical study of the advances and trends in e-governments relating to transparency, openness and hence accountability in the local governments	Tests of difference of means, multidimensional scaling and cluster analysis	N/A	Transparency, interactivity, usability and website maturity
Page (2004)	10 states	USA	Local governments	Examines the intersection of two types of innovation that are accountability for results and interagency collaboration	Platforms of accountability for results	N/A	External authorisation, internal inclusion, result measurement, managing for result
Ndire (2020)	The government websites of 72 governments	East African countries	Local governments	Develops an index assessment reviews progress in online services delivery, open data and mobile services and public involvement	Simple random sampling technique	E-government development	Usability, accessibility

Furthermore, the time consumed in a website to find information is an important factor affecting the user's perception of such a website. Lin and Lu (2000) consider that the quality of the information system, which includes the perceived information quality, accessibility and response time of the website, is a very influential element in the user's beliefs of usefulness and swiftness of use of a website. In the proposed e-AI, web usability is measured in time, namely minutes, consumed by a citizen to find the desired information. A quantitative scale was developed in previous literature, but we consider that if a citizen spends more than 15 minutes searching for the information, it is assumed that information is not available.

a 1 point: if less than 3 minutes are consumed until finding the searched information

b 0.75 points: if it takes 4 to 6 minutes

c 0.5 points: if it takes 7 to 10 minutes

d 0.25 points: if it takes 10 to 15 minutes

e 0 points: if it takes more than 15.

3.3 Dimensions of the index

The e-AI evaluates the accessibility and usability of items of information included in seven dimensions, with a total of 75 items of the GRI, in order to assess the information disclosed in CGs websites. Several researchers have proposed analysing the disclosure of governmental information based on the GRI framework (e.g., Alcaraz-Quiles et al., 2014). The GRI items aim to advice organisations on how to provide comparable information about their activities in seven dimensions, for the exchange of reliable and transparent information (Lodhia et al., 2012).

The seven dimensions include different issues as briefly explained in the following paragraphs[1]:

- The 'strategy and analysis' perspective includes six items offering a general strategic view of the organisation with key impacts, risks and opportunities. It is intended to give insight on the governments' strategic topics.
- In the 'information parameters' perspective six items are included, providing an overview of the process that the organisation has followed to define the report content, the identified material aspects and their boundaries and restatements.
- The 'government, undertakings and stakeholder participation' perspective includes eight items delivering an overview of the organisation's stakeholder engagement during the reporting period, such as if the stakeholder selection criteria are published.
- In the 'economic indicators' perspective 24 items are included concerning CG impact on the economic conditions of its stakeholders and on the economic system overall.
- The 'social indicators' perspective includes ten items concerning the impact CG has on the social system within which it operates, such as social services expenses, pension plans, etc..

- Finally, the 'environmental' perspective includes thirteen items concerning the CG impact on living and non-living natural systems, including land, air and water ecosystems.

Each one of these perspectives is made up of indicators focusing on key processes for institutional management in the CG. Appendix A displays the complete list of the GRI items, grouped by the seven above-mentioned dimensions.

The seven perspectives will have equal weight in the e-AI, contributing equally for the calculation of the final rating. Therefore, in accordance with the above, the indicators for each dimension also have an equal weight. As explained, the e-AI evaluates two variables – accessibility (w-click) and usability (w-time). Subsequently, it can be translated through the following formula, which takes into account the necessity of the index to be easily interpretable:

$$e\text{-}AI = (SUM\,[Inform\_found * (w\text{-}clicks + w\text{-}time)]/150) * 100 \quad (1)$$

Both the accessibility and usability measures have been incorporated to embrace a more holistic measure of the level of CGs accountability.

As disclosure indexes are usually constructed in such a way as to have a maximum score, the e-AI has a specific rating that goes from zero (0) to one hundred (100), being 100 the highest possible rating. This percentage approach was also followed by Lourenço et al. (2013) among others.

The items of the GRI are 75 questions, so for the variable 'usability' (w-time) it would have a maximum 75 points, likewise with the variable 'accessibility' (w-click) with another 75 points. Then, the total points that a country could have would be the sum of 150 points of accessibility and usability, if all information items are found, corresponding to 100% in the e-AI, i.e., the level of accountability. In Table 2 the different parameters of the formula are explained.

Table 2 Parameters of the formula

Code	*Parameters*	*Values*
Inform_found	Availability	1: if information is found
		0: if the information is not found
w-clicks	Accessibility	1 point: if it takes less than 5 clicks to find the information
		0.75 points: if it takes 6 to 10 clicks
		0.5 points: if it takes 11 to 15 clicks
		0.25 points: if it takes 16 to 20 clicks
		0 points: if it takes more than 20 clicks
w-time	Usability	1 point: if less than 3 minutes are consumed until finding the searched information
		0.75 points: if it takes 4 to 6 minutes
		0.5 points: if it takes 7 to 10 minutes
		0.25 points: if it takes 10 to 15 minutes
		0 points: if it takes more than 15

From here, several levels of scoring can be considered in the e-AI of the CGs. In our view, the following three levels would make interpretation easier:

a low: if the index scores less than 50 points

b medium: if the index scores 50 or more and less than 80 points

c high: if the Index scores 80 or more points.

4 e-AI in South American countries

SA countries were selected for applying the e-AI because, in addition to most of those countries sharing a common cultural and regulatory background, represented by the Spanish dominance of most of the territory for several centuries, there is scant research in accountability in this geographical context. Also, some of these countries are often pointed out as having accountability problems, linking to corruption issues.

Before analysing these countries' CGs level of online accountability, it is important to contextualise the current situation in each of them, as this supports a better interpretation of the results of the e-AI.

4.1 South American countries brief contextualisation

A brief analysis of the disclosure and transparency measures adopted by the South American CGs is presented below in alphabetic order.

4.1.1 Argentina

Increasing efforts have been made in Argentina, including the particular case of the MPF (Ministerio Público Fiscal), to undermine clientelism and enhance governmental transparency. Furthermore, all state agencies and public employees are subject to accountability claims made by the citizenry and the *media*, and state agencies were created to be in charge of controlling public sector entities. However, institutional weaknesses continue to exist, as the country still lacks regulations and fundamental aspects of control and accountability at all levels of public administration (Rohrer, 2020).

4.1.2 Bolivia

In Bolivia, the level of public information disclosure remains low. There has been a general absence of a culture of transparency, which has not been able to advance due to the little democratic experience, bureaucratic inefficiency, the tradition of corruption with more or less intensity in the different governments, and the absence of a democratic culture in the citizenry with the principle that people have the right to demand both accountability and the renunciation of inefficiency by public officials (Apaza, 2012).

4.1.3 Brazil

In Brazil, four main transparency measures stand out: the Federal Government procurement portal, the enactment of the fiscal responsibility law, the creation of the federal government transparency portal, and the legislation on access to public information (Moreira and Claussen, 2011).

4.1.4 Chile

In Chile, the institutional transformation represented by a policy of transparency was complex, implying the modernisation of the State and a change in the way of doing things. Among several initiatives, laws were created on public ethics, access to public information, reforms to lobbying regulations, probity of public officials and political party financing, and innovations in digital management (Moya et al., 2012; Sousa, 2010; Zalaquett and Muñoz, 2008).

4.1.5 Colombia

Colombia has been a pioneer in hearings and public disclosure of preliminary drafts of administrative acts, specifically in the 1991 Constitution. Since then, there have been several legislative initiatives, such as the Law on Traffic Lights and Tax Regulations, Decree on Tax Policies, laws to incorporate new technologies in the public administration, the creation of the Anti-Corruption Statute, and the creation of an open public procurement system. E-government was also implemented in those departments demonstrating low levels of information disclosure (Gómez and Montesinos, 2014).

4.1.6 Ecuador

In Ecuador, progress has been made with laws on access to public information, establishing the publication online of, for example, the budget, information on salaries and benefits of public servants, concessions, permits and contracts, subsidy programs and results of audits of internal and external control bodies (Cunill, 2006). In 2007 the fight against corruption in public administration was declared a State policy. In 2008, as a result of a new Constitution, the Transparency and Social Control Function was created to promote control of public sector entities and bodies. In 2014, the National Secretariat of Public Administration developed the e-government plan as a way to promote citizen participation and as a platform for transparent management (Jara, 2017).

4.1.7 Guyana

In Guyana, clear efforts were made to address the elements of governance, accountability and management as a part of their strategic planning arrangement. The most noteworthy achievement was democratisation and decentralisation of the key process as a central strategy used to strengthen the critical elements of governance required to improve accountability performance (Hutton, 2015). However, difficulties in the information access need to be overcome for a political system of accountability to be developed, without abuse of power.

4.1.8 Peru

Peru began to promote citizen participation in the monitoring and controlling of public administration in 1994, with the so-called Law 26300 on the rights of participation and control of citizens. There have also been laws protecting the right to information of citizens. An obligation was institutionalised to have certain information in standardised transparency portals (de la Cruz, 2006). The country joined the Open Government Association in 2011, and there was a specific initiative, at the national and regional level,

for transparency in the extractive industries. However, Peru lacks supporting systems, which makes it more difficult to improve governance and democracy; transparency itself has little impact on political behaviour (Hawkins et al., 2017).

4.1.9 Paraguay

In Paraguay, no significant steps have been taken, although the building of the foundations for the fight against corruption has begun, with the National Integrity Plan and the creation of the Transparency International Paraguay chapter (Velázquez and Pereira, 2008). More recently, the National Anti-Corruption Secretariat and the National Plan for the Prevention of Corruption were established and, as part of the policy of greater information transparency, the country joined the Open Government Association initiative in 2011. However, the country still requires greater accessibility to information on its websites for greater interaction between citizens and the public sector (Andrade et al., 2019).

4.1.10 Suriname

Suriname is a country taking part of several international treaties (e.g., International Covenant on Civil and Political Rights and Inter-American Convention on Human Rights), in which the right to information is essential in order to experience other basis, such as the right of freedom of speech. In this context, Suriname ratified the International Convention against Corruption of the Organisation of American States in 2002. For this reason, the country has developed mechanisms that prevent, detect, punish and fight corruption. Still, the need for legislation on the promotion of access to information is crucial (Sharman, 2012).

4.1.11 Uruguay

In Uruguay, the application of information technologies in government has been considered an important strategy for reforms, highlighting the possibility of transforming the fundamental relationships between government, citizens, businesses and other stakeholders. The country has also implemented anti-corruption measures, such as passing the Law on Anti-Corruption of Civil Servants and the Law on the Right of Access to Public Information, and the creation of the Board of Transparency and Public Ethics (Skaar, 2013).

4.1.12 Venezuela

Venezuela is in an emerging situation. The eradication of corruption requires a reengineering of the justice system, the controllers and the police. So far, there is no law on access to public information (De Freitas, 2008). In terms of the usability of web pages and their quality, weaknesses are found in the design, content, accountability and accessibility of information (Belloso and Primera, 2015).

The above shows that in most SA countries, there has been accelerated progress in regulations and laws on access to public sector information, especially in relation to critical issues, the budget being the most important. Political reforms (such as decentralisation and innovation in public management) have been implemented in the last

ten years, increasing political confidence with an emphasis on political legitimacy. Part of this legitimacy introduces other transparency mechanisms, such as procedural mechanisms in the formation of public decision, monitoring of results and the most recent mechanism on the management of interests. Galvez et al. (2012) explain that experience in self-regulation is the factor that most influences the transparency requirement.

Furthermore, the adoption of technological innovations such as e-government, or open government, has made government more efficient, inclusive and accessible to citizens. Similarly, the socio-economic development and the increase in the creation of social organisations, citizen observatories, civil society bodies and organisations in search of transparency (such as the secretariats of Transparency International, which develop systems to monitor transparency in public administration and fight against corruption) has been remarkable.

4.2 Applying the e-AI

The research initially involved a review and analysis of publicly-available documents and information from the South American CGs websites. Hence, a cross-sectional study with non-experimental design (Creswell, 2014) was carried out to infer the relevance of the transparency of the countries' CGs official websites via information disclosure.

Two analysts simulated as if they were citizens with an average cultural education, looking for the information contained in the GRI questionnaire within the different South American CGs websites (see Appendix B), writing down the number of clicks and time consumed, while searching for each information item. An average of times and number of clicks consumed was calculated. Reliability was assured by these analysts working together and mutually checking their results.

In order to carry out the information search, the analysts examined each CG official website interface and developed a database with the collected number of clicks and amount of time consumed in looking for the GRI issues. Data collection took place during four months. All South American countries (Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Guyana, Paraguay, Peru, Suriname, Uruguay, and Venezuela) have been included in the analysis.

Once all the information was gathered, the e-AI was calculated, including the two previously mentioned dimensions: Accessibility (measured by the number of clicks needed to reach the searched information) and Usability (measured by the time consumed to reach the searched information, measured in minutes). Subsequently, the following analyses were performed and the ranking of these South American CGs accountability levels was made.

South American CGs official websites are quite similar in its structure. However, there are some differences worth noticing. In particular, the design and services offered by Uruguay, Chile and Argentina are very attractive and user friendly while Ecuador, Bolivia and Venezuela web pages are the opposite, not very attractive and not very user friendly. Neither of them allow access using different languages (only Spanish for most, except for Portuguese in the case of Brazil, English in Guyana and Dutch in Suriname), neither windows nor dynamic information with images and videos, except for Uruguay. They do offer an institutional email for citizens to write about any issue and a map to help citizens find their way easily. All countries use their social networks frequently, except Suriname and Guyana. Only Argentina, Paraguay and Uruguay have technical

information about the portal in the footer. It is interesting to highlight that Argentina has a vertical surfing menu with different types of usable information citizens can consult and access, together with a possibility to make some administrative formalities through the web. Finally, Bolivia and Venezuela websites do not have a search engine.

The descriptive statistical results (Table 3) show that, both in accessibility and usability, the Economic and Social indicators have the highest maximum values (22 and 17 clicks, and 19 and 16 minutes respectively). Additionally, while the biggest usability mean value is for Economic indicators (6.85 minutes) as it was expected, that is not the case for accessibility, whose higher mean value is for the Information parameters (7.76 clicks) followed by the Economic indicators (7.74 clicks). The lowest values are in Government, undertaking and stakeholders' issues, with a mean value of 5.34 clicks and 5.13 minutes. Therefore, for accessibility mean values are between 5 and 8 clicks, while for usability they are between 5 and 7 minutes. Interestingly, standard deviations are comparatively bigger, with all of them bigger than 2 clicks, and getting as big as 3.48 clicks in the case of Economic indicators for accessibility, and as small as 1.89 minutes for Strategy and Analysis, and up to 3.08 minutes for Economic indicators, in the case of usability.

These figures allow observing that greater commitment is required to promote accountability in the economic, social and environmental aspects. In a more detailed analysis (see table in Table 4), Environmental indicators are more difficult to find disclosed in the websites. Financial statements, debt capacity, budgets and tax pressure (included in the Economic indicators) were very difficult to find too. Furthermore, social services expenses and offers of public employment made public, present difficulties in usability and accessibility (question 54 GRI), with values well below the average. Overall, SA governments reveal, to a large extent, Information parameters while it is difficult to reveal environmental indicators, commitment and participation of interest groups.

The lowest values are for environmental indicators and social indicators, regarding both usability and accessibility in Venezuela, while the organisation profile dimension has obtained a high rating average. This can be explained because there is not 'Freedom of Information Acts', in terms of the websites usability and their quality in the design are weak, in the content and accessibility of information (De Freitas, 2008). Suriname has the best in usability value and Uruguay is the best in accessibility value, this can be explained by highest values in terms of governance, corruption and socioeconomic performance this country has in line with del Campo et al. (2020). Regarding the Information parameters, the usability in Suriname has the highest average rating. It is important to mention that according to Suriname's multi-year development plan (2012–2016), one of the most important elements to increase participative democracy is to provide information to the citizens. In this context it is mentioned that the government will take legislative measures to promote a more transparent system of governing (Sharman, 2012). With respect to the accessibility, Guyana presented one of the major average.

In the government, undertakings and stakeholders dimension, the usability and accessibility is high in Chile, being the best average in the region; on the opposite side, Venezuela has the worst. Within the strategy and analysis dimension, Bolivia and Suriname should improve in both usability and accessibility, while Uruguay presented high usability information. The best accessibility values were obtained in Chile and Uruguay. Additionally, the usability of information is low in Venezuela and Peru, and high in Suriname.

Table 3 Descriptive statistics for accessibility and usability by GRI dimensions

		Total	*Strategy and analysis*	*Organisation profile*	*Information parameters*	*Government, undertaking and stakeholders*	*Economic indicators*	*Social indicators*	*Environmental indicators*
Accessibility (clicks)	Min	1	3	1	4	1	2	1	1
	Max	22	12	13	14	15	22	17	13
	Mean	7.08	6.86	6.03	7.76	5.34	7.74	7.05	7.37
	Std. dev.	3.04	2.17	2.92	2.38	2.95	3.47	2.88	2.43
Usability (minutes)	Min	1	3	1	3	1	1	1	1
	Max	19	10	13	12	15	19	16	14
	Mean	6.31	5.98	5.38	6.55	5.13	6.85	6.20	6.76
	Std. dev.	2.89	1.89	2.75	2.63	2.73	3.08	2.83	2.90

Table 4 Electronic accountability index (e-AI) with dimensions[a]

Country	*Dimension*	*Usability*	*Accessibility*	*e-AI (%)*
Suriname	Strategy and analysis	6.00	4.50	
	Organisation profile	7.50	6.00	
	Information parameters	6.00	5.00	
	Government, undertakings and stakeholder	7.00	5.00	
	Economic indicators	22.75	18.00	
	Social indicators	9.00	7.00	
	Environmental indicators	13.00	10.25	
	Total	71.25	55.75	84.67
Chile	Strategy and analysis	4.50	4.50	
	Organisation profile	6.50	6.00	
	Information parameters	4.50	4.50	
	Government, undertakings and stakeholder	8.00	7.75	
	Economic indicators	21.75	19.25	
	Social indicators	8.50	8.25	
	Environmental indicators	10.50	10.00	
	Total	64.25	60.25	83.00
Uruguay	Strategy and analysis	4.25	4.5	
	Organisation profile	7	7.75	
	Information parameters	4.5	4.5	
	Government, undertakings and stakeholder	7.5	7	
	Economic indicators	17	17.5	
	Social indicators	8.25	8.5	
	Environmental indicators	11	12	
	Total	59.5	61.75	80.83
Guyana	Strategy and analysis	4.75	3.25	
	Organisation profile	6.75	5.75	
	Information parameters	5.00	6.00	
	Government, undertakings and stakeholder	6.25	6.25	
	Economic indicators	18.75	16.50	
	Social indicators	7.75	6.25	
	Environmental indicators	9.75	8.00	
	Total	59.00	52.00	74.00

Note: [a]The points in the columns of usability and accessibility are not in percentage, but consider the number of items (also per dimension) in the GRI questionnaire – maximum of 75.

Table 4 Electronic accountability index (e-AI) with dimensions[a]

Country	*Dimension*	*Usability*	*Accessibility*	*e-AI (%)*
Brazil	Strategy and analysis	4.50	4.50	
	Organisation profile	6.50	6.00	
	Information parameters	3.75	3.00	
	Government, undertakings and stakeholder	7.25	6.25	
	Economic indicators	18.50	15.00	
	Social indicators	8.50	6.50	
	Environmental indicators	10.75	9.50	
	Total	59.75	50.75	73.67
Paraguay	Strategy and analysis	4.75	3.50	
	Organisation profile	6.50	6.25	
	Information parameters	4.25	3.50	
	Government, undertakings and stakeholder	7.75	7.25	
	Economic indicators	17.75	15.75	
	Social indicators	7.75	7.00	
	Environmental indicators	9.50	8.75	
	Total	58.25	52.00	73.50
Ecuador	Strategy and analysis	4.75	4.25	
	Organisation profile	6.50	5.75	
	Information parameters	4.50	4.50	
	Government, undertakings and stakeholder	6.25	5.75	
	Economic indicators	20.00	15.25	
	Social indicators	8.00	6.75	
	Environmental indicators	9.25	7.25	
	Total	59.25	49.50	72.50
Argentina	Strategy and analysis	4.50	3.00	
	Organisation profile	6.75	6.00	
	Information parameters	5.50	3.75	
	Government, undertakings and stakeholder	7.50	7.00	
	Economic indicators	18.00	14.00	
	Social indicators	7.25	6.50	
	Environmental indicators	10.50	8.00	
	Total	60.00	48.25	72.17

Note: [a]The points in the columns of usability and accessibility are not in percentage, but consider the number of items (also per dimension) in the GRI questionnaire – maximum of 75.

Table 4 Electronic accountability index (e-AI) with dimensions[a]

Country	*Dimension*	*Usability*	*Accessibility*	*e-AI (%)*
Colombia	Strategy and analysis	5.25	3.75	
	Organisation profile	6.50	6.00	
	Information parameters	4.50	3.75	
	Government, undertakings and stakeholder	7.50	6.50	
	Economic indicators	15.50	12.50	
	Social indicators	9.25	7.75	
	Environmental indicators	10.50	8.50	
	Total	59.00	48.75	71.83
Bolivia	Strategy and analysis	6.00	5.00	
	Organisation profile	7.00	5.75	
	Information parameters	4.50	2.75	
	Government, undertakings and stakeholder	7.50	5.50	
	Economic indicators	17.50	13.75	
	Social indicators	7.75	5.75	
	Environmental indicators	10.00	7.50	
	Total	60.25	46.00	70.83
Peru	Strategy and analysis	5.00	3.00	
	Organisation profile	7.25	5.50	
	Information parameters	4.50	1.50	
	Government, undertakings and stakeholder	7.50	5.00	
	Economic indicators	16.25	13.75	
	Social indicators	7.25	7.00	
	Environmental indicators	10.00	6.25	
	Total	57.75	42.00	66.50
Venezuela	Strategy and analysis	5.50	5.25	
	Organisation profile	5.25	4.00	
	Information parameters	4.50	3.00	
	Government, undertakings and stakeholder	4.50	3.25	
	Economic indicators	15.25	8.50	
	Social indicators	6.25	4.00	
	Environmental indicators	6.50	3.25	
	Total	47.75	31.25	52.67

Note: [a]The points in the columns of usability and accessibility are not in percentage, but consider the number of items (also per dimension) in the GRI questionnaire – maximum of 75.

Figure 1 presents the values of the two main parameters of the e-AI (usability and accessibility), per country, synthesising the above.

Figure 1 Usability and accessibility (see online version for colours)

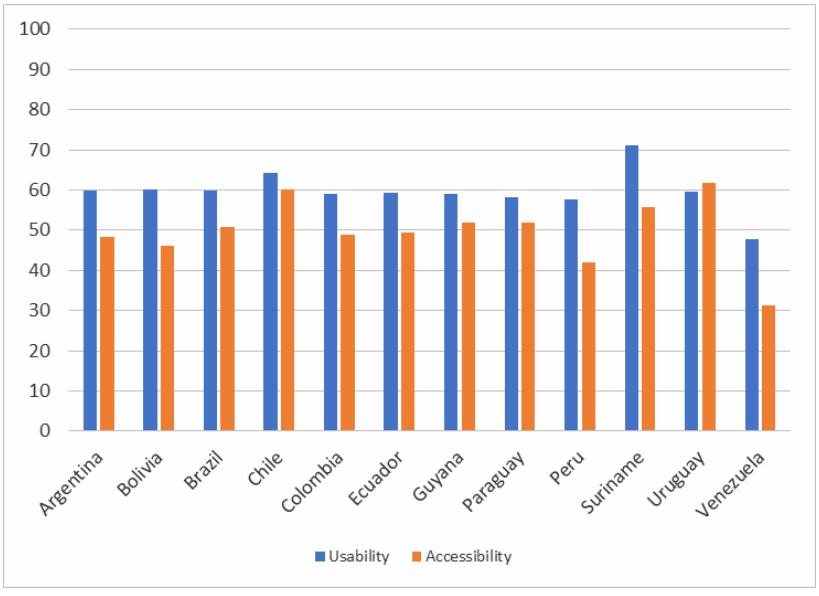
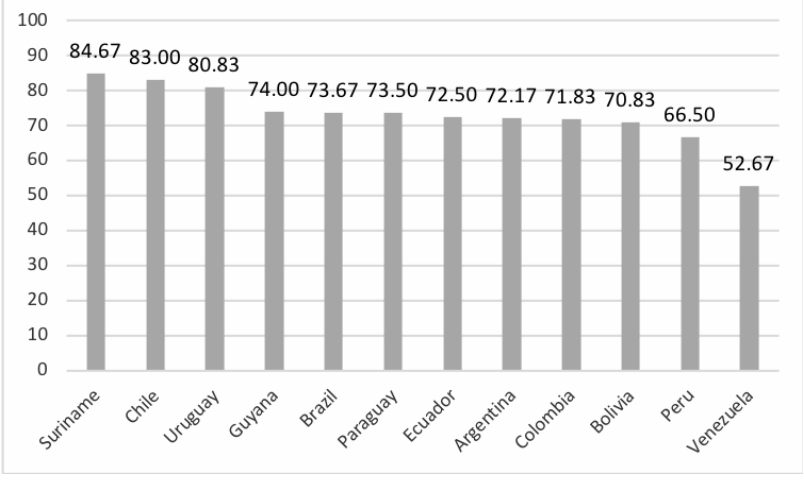


Figure 2 E-accountability index (e-AI) ranking



As to accountability level, applying the e-AI, the CGs of Suriname, Chile and Uruguay show the highest accountability levels, providing more and more accessible information (above 80 points). These countries have made progress in the law of free access to information, as described in the countries' contextualisation, leading them to a high level of accountability according to the e-AI, as displayed in Figure 2. The CGs of the rest of the countries show medium levels of accountability, presenting difficulties in the

accessibility and usability of information disclosed. Summarising, Suriname rank the highest in the overall e-AI with scores of 84.67, followed by Chile and Uruguay, with 83 and 80.83 respectively. Peru and Venezuela ranked the lowest, with scores of 66.50 and 52.67 respectively. The whole of the South American region has an e-AI average score of 73.01.

The e-AI evidences that, although there has been eventual progress, most countries still struggle with difficulties to be accountable, with only three (25%) of South American CGs websites showing *high* level of accountability (slightly over 80 points) – Suriname, Chile and Uruguay (in grey in Table 3). The rest of the countries are situated in the *medium* range, between 50 and 80 points. Problems persist in the website accessibility, with six SA countries scoring lower than 50 points out of 75, whereas in usability only Venezuela is below 50 points out of 75, as shown in Table 4.

These results reflect the last few years' legal and political SA context, where countries have made great strides in the fight against abuse of power. The region experienced solid increase in laws and institutions that promote transparency and accountability in governments. Although each country's Ministry of Justice and Police is in charge of combating corruption, such efforts are being controlled by laws. For example, Chile passed a law on public probity and prevention of conflicts of interests (2015) and Uruguay is implementing e-government accountability with citizens' services. Concretely, in these countries there has been a great improvement throughout these last two decades in their Voice and Accountability indicator and in the corruption indicators, factors that might be the reason for a higher increase on governments' openness through their websites (del Campo et al., 2020). Similarly, progress continues across SA countries, although there are investigations of cases of abuse of power, namely the Odebrecht case (2017) with bribery and illegal funding in exchange for public contracts that resulted in sanctions for businessmen and political figures at the highest levels in Brazil, Ecuador, Peru, Argentina, Colombia and Venezuela, among others. Concretely Venezuela, Ecuador and Paraguay have the worst governability performance throughout the last two decades. Furthermore, Colombia and Venezuela have still a high degree of political instability (Hermosa et al., 2019).

These research findings, because derived from an accountability standpoint, present significant differences from those in del Campo et al. (2020), which demonstrated how governability performance of SA countries evolved in the last two decades regarding the analysed indicators and its four clusters classifications. Specifically, Chile and Uruguay have been the best performers regarding governance, corruption and socioeconomic; and Suriname, Argentina, Brazil were considered as medium performance, while Venezuela, Ecuador and Paraguay were denominated as bad governance performance countries, and Bolivia, Colombia, Guyana, Peru named bad socio-economic performance countries.

5 Conclusions

One of the main purposes of decades of public sector reforms in many countries has been the need to provide their citizens with understandable, reliable and meaningful information about the performance of their CGs activities and programs. In this paper an electronic accountability index was proposed – the e-AI – which allows comparing the quantity, as well as the accessibility and usability, of information made available in CGs websites, adding to studies such as those of Alcaraz-Quiles et al. (2018) and Salas (2015),

who have proposed different accountability indexes in specific areas of the public sector for several individual countries.

The key issue of this research is the construction of a digital measurement instrument that, using the GRI survey items as support and foundation, is therefore based on principles of good governance to measure accountability. Very few studies have considered how CGs websites can better contribute to provide information to extend the conventional models of accountability and also include accountability dimensions such as strategy, organisation, information parameters, government, stakeholders, economic, social, or environmental indicators. Accordingly, while developing from a public accountability perspective, the e-AI innovates in its content.

The holistic model of the proposed e-AI is a tool that can be used by academics, practitioners and governing authorities of countries around the world, for national and international analyses. It is developed from core questions included in the GRI's survey dimensions, representing and measuring a country's CG accountability level.

Accordingly, this research emphasises the importance of information disclosure, accessibility and usability of CGs websites, under the GRI approach, in several countries, in terms of the optimisation of accountability in its different dimensions, the electronic dimension being fundamental nowadays. Thus, how could central governments' online accountability be measured, considering website and accessibility dimensions is a controversial issue.

To exemplify its usefulness the e-AI was applied to all South American CGs websites. Despite this being a critical region requiring assessing accountability issues, the academic studies on the topic embracing SA countries are rare, so a contribution is also made here. While applying the e-AI to those countries, this study showed to what extent the official websites of their governments are effective in their information disclosure.

The majority of the countries were ranked in medium levels of accountability (between 50% and 80%); the major problem seems to be in information accessibility.

Further research is needed to determine whether the e-AI correlates with improvements in countries ICT level, positively impacting on information disclosed in their CGs websites. It is an expansion of the conventional accountability models that also include dimensions such as strategy, organisation, government, stakeholders, economic, social and environmental indicators. In addition, as a classification tool, the e-AI allows countries to understand their position in relation to other countries, resulting in pressure to improve their level of accountability and working as a tool for comparative analysis.

Therefore, this index can be used by CGs managers to improve their transparency and accountability practices, and the application to the SA region is an example that could serve to other jurisdictions. Also, the results of the present study contribute to achieve a theoretical and empirical framework for both academics and practitioners regarding accountability measures, since there are scarce studies and empirical measures of accountability. Thus, this index can become widely used by policy-makers, analysts, journalists, risk rating agencies and multilateral donor aid agencies. It is an electronic accountability index that takes into account the principles of good governance to improve the disclosure of information and transparency of governments. Finally, this index could be used by both academics and practitioners, and in particular by governing authorities, to measure the online accountability levels of governments and improve them worldwide.

This study has limitations such as that the index has not been applied to other countries with different contextualisation and there are other items that could be included.

Also the time consumed in researching the 75 answers to the GRI items could be simplified.

Therefore, the results of this paper have led to share interest in developing future lines of research. For example, one approach could be to apply the e-AI index to other emerging countries in Central America, Asia or Africa, being able to compare with the results obtained for South America. In addition, to improve the possible explanatory value of different variables, it would be interesting to do an analysis of other variables that could influence the disclosure of accountability, identifying different stakeholders and the selection criteria in the field of accountability.

Finally, we would also like to further consider the quality or efficiency of the information collected in the websites for e-government assessments. The quality of the given information cannot be truly known, but indicators about country specific data (e.g., about corruption or World Bank estimates of information quality) could be very valuable for further analysis. Efficient information is another avenue for research in order to avoid possible flaws.

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Appendix A

Global Reporting Initiative items[2]

Strategy and analysis

1 Is a statement made by the head of government on the importance of sustainability for the central governments and its strategy?

2 Does this statement set out priorities, strategies and key factors for the short-medium term?

3 Does this statement address long-term trends relevant to priorities concerning sustainability?

4 Does this statement include events, achievements and failures during the period in question?

5 Does this statement include goals-oriented performance perspectives?

6 Does this statement include challenges and targets for the coming year and the forthcoming 3–5 years?

Organisation profile

7 Does the central governments own trademarks?

8 Are different areas clearly defined?

9 Do central governments officials have area-defined responsibilities?

10 Is the situation of the regional seat of government stated?

11 Is a statement made of the number of countries in which significant activities are carried out?

12 Is the number of employees stated?

13 Have significant changes taken place in the central governments structure or size?

14 Has the central governments been awarded prizes or other recognition during the period in question?

Information parameters

15 Is a statement made of the period corresponding to the information supplied?

16 Is the date of publication of this information stated?

17 Is the presentation frequency of this information stated?

18 Is there a liaison person for questions concerning the information supplied?

19 Does the information supplied include dates of specific interest for suppliers and users?

20 Is priority assigned to the aspects addressed in the information supplied?

Government, undertaking and stakeholders

21 Is there a given person or government body responsible for defining organization strategy?

22 Does the chief official hold any other public or private post?

23 Do there exist works' committees or workers' representatives?

24 Are the stakeholders included in the information supplied?

25 Does the information presented include the government program?

26 Are the Government program commitments met?

27 Has the ruling party an absolute majority?

28 Are stakeholder selection and identification criteria included in the information supplied?

Economic indicators

29 Is an expenditure forecast/beneficiary population published?

30 Is a revenue forecast/beneficiary population published?

31 Are revenues transferred from other public administrations/total revenues published?

32 Tax pressure

33 Is gross expenditure, detailed by type of payment, published?

34 Is gross expenditure, detailed by financial classification, published?

35 Is capital expenditure, detailed by financial classification, published?

36 Are the services costs disclosed?

37 Average payment period

38 Are the current competitions disclosed?

39 Is the contractor profile disclosed?

40 Future services calls

41 Is the policy on internal promotion published?

42 Are staff training facilities published?

43 Indebtedness capacity

44 Is a statement made of future financial risk?

45 Equity and assured goods

46 Is a report published on the expenditure forecast?

47 Are data given on subsidies received?

48 Are Financial Statements disclosed?

49 Is information about accounting policies disclosed?

50 Is expense budget disclosed?

51 Does the latter include medium-term perspectives?

52 Are the following key economic assumptions and forecast made public: GDP growth, employment, unemployment, inflation and rates of interest?

Social indicators

53 Is the offer of services made public?

54 Social services expenses

55 Is a subsidies announcement made for business activities?

56 Is a statement made on pensions obligations to employees?

57 Are grants offers to neighbourhood associations made public?

58 Are offers of public employment made public?

59 Are grants offers to NGOs made public?

60 Are indicators of effectiveness and efficiency published?

61 Initial salary/local minimum salary

62 Local supplier expense/Total expense

Environmental indicators

63 Is information published on the initiatives taken to alleviate the environmental impact of products and services?

64 Is the degree of reduction of the above impact stated?

65 Is a statement made of the direct consumption of energy obtained from primary sources?

66 Is a statement made of the consumption of intermediate energy?

67 Is a statement made of the actions taken to increase savings via conservation or increased efficiency?

68 Is information published on initiatives taken to promote products and services that are energy efficient or based on the use of renewable energies?

69 Is information published on reductions in energy consumption as a result of the above initiatives?

70 Is information published on the initiatives taken to reduce indirect energy consumption?

71 Is information published on reductions achieved by the above initiatives?

72 Is information published on the different sources of water supply employed, and the volume obtained from each source?

73 Is information published on the percentage and total volume of water that is recycled and reused in the country?

74 Is information published on the disposal of waste water by the country?

75 Is information published on the total and type of expenditure on environmental investment?

Appendix B

The SA central governments' official portal websites

This research has visited the websites that can be found in Appendix B for each country. From the main page, researchers have tried to answer all the 75 questions in Appendix A (GRI) measuring the accessibility and usability variables. We had to move to different web addresses from the main one.

1	Argentina	https://www.argentina.gob.ar
2	Bolivia	https://www.presidencia.gob.bo/
3	Brazil	https://www.gov.br/pt-br
4	Chile	https://www.gob.cl
5	Colombia	http://es.presidencia.gov.co
6	Ecuador	https://www.presidencia.gob.ec/
7	Guyana	https://motp.gov.gy
8	Paraguay	https://www.paraguay.gov.py
9	Peru	https://www.gob.pe/
10	Suriname	http://www.gov.sr/
11	Uruguay	https://www.presidencia.gub.uy/
12	Venezuela	http://www.mpppst.gob.ve/mpppstweb/index.php/category/noticias/gobierno-nacional/presidencia/

Notes

1 https://www.globalreporting.org/standards/gri-standards-download-center/.

2 Source: https://www.globalreporting.org/standards/.