

Online Transparency for Accountability: One Assessing Model and two Applications

Rui Pedro Lourenço^{1,2}, Patrícia Moura e Sá^{2,3}, Susana Jorge^{2,3} and Anna Francesca Pattaro⁴

¹INESC (Instituto de Engenharia de Sistemas e Computadores), Coimbra, Portugal

²FEUC (Faculty of Economics, University of Coimbra), Portugal

³NEAPP (Centre for Research in Public Policy and Administration), University of Minho, Braga, Portugal

⁴Department of Economics “Marco Biagi”, UNIMORE (University of Modena and Reggio Emilia), Modena, Italy

ruiloure@fe.uc.pt

pmourasa@fe.uc.pt

susjor@fe.uc.pt

annafrancesca.pattaro@unimore.it

Abstract: This paper proposes, in the context of Open Government, a model to assess how public sector entities are taking advantage of the Internet as an information disclosure tool and a means to promote transparency, specifically in what concerns the use of public resources (*input transparency for accountability*). The assessment model and resulting *Transparency Index* gives particular attention to the disclosure of detailed (disaggregated) data according to the principles of *Open Government Data*, namely by valuing data visibility, adequate format for further processing, and the autonomous presentation of individual information items. Subsequently, the paper demonstrates the applicability of the proposed model by carrying out two assessment exercises on two subsets of Portuguese and Italian municipalities. Results show that, all in all, the municipalities analysed do not yet disclose enough information useful for accountability processes and they do not take advantage of the Internet potential to make the data provided more visible and re-usable by citizens and local stakeholders. Alone, high-level policy directives, governmental requirements and national legislation guaranteeing access to information are not enough to ensure public entities (municipalities in particular) disclose all the relevant data, and therefore specific guidelines are needed.

Keywords: Accountability; Input transparency assessment; Internet; Open Government

1 Introduction

Over the last decades, transparency and accountability in the public sector were topics recurrently studied, especially in international financial crises contexts, as the one we have been facing. Democratic accountability requires governments to increase transparency, disclosing more information to citizens, hence promoting public expenditure scrutiny and preventing corruption and wasting of public resources. According to the United Nations, the concepts of integrity, transparency, and accountability are recognised by the majority of Member-States as essential foundations of their public sector entities (Armstrong, 2005).

In this search for more transparency, regarded as essential to foster accountability, the role of information technologies is crucial. Public sector entities¹ have been resorting to the Internet for service improvements, innovation and participation processes, as a means to promote transparency and accountability – especially through more information disclosure – and, thus, enhancing responsiveness towards citizens. Websites in particular offer an opportunity for information disclosure.

Nowadays several countries have adopted open government portals such as Data.gov and Data.gov.uk which aim to provide a single entry-point to access governmental data. But apart from these flagship examples, such portals are still underdeveloped and lack notoriety in many countries: for instance, both the Italian portal

¹ *Public sector entities or bodies* refer to “State, regional or local authorities, bodies governed by public law and associations formed by one or several such authorities or one or several such bodies governed by public law” (European Parliament and Council, 2003).

(<http://www.dati.gov.it/>) and the Portuguese portal (<http://www.dados.gov.pt>) disclose few datasets, most of them 'simple' statistics. Therefore, in order to find data concerning public sector entities it is still necessary to rely on entities' institutional websites.

Thus, there is a need for models specifically targeted towards assessing online information disclosure. In fact, questions may rise concerning whether the potential of the Internet is being used to provide timely, accurate and easy-to-use information to citizens and other stakeholders, accomplishing the final purpose of increasing trust in governments; or whether institutional websites are sufficiently open and the information disclosed relatively easy to be accessed and analysed by 'ordinary' citizens.

1.1 Underlying concepts

Worldwide, the topic of open government has been placed at the core of the political agenda by means of directives such as the *Transparency and Open Government Memorandum* (Obama, 2009) and further detailed in the *Open Government Directive – OGD* (Orszag, 2009) and the EU directive 2003/98/EC on the *Re-use of Public Sector Information – PSI Directive* (European Parliament and Council, 2003). Subsequently, *The European e-Government Action Plan 2011-2015* (European Commission, 2010) gave another ambition to European efforts on open government by identifying as policy priorities "User Empowerment", including the "Re-use of Public Sector Information", the "Improvement of Transparency", the "Involvement of citizens and businesses in policy-making processes", and the "Collaborative Production of Services".

To cope with the complexity of the open government concept, Linders and Wilson (2011) analysed the US open government effort and decomposed "the 'Open Government' universe into its discrete, actionable components" which the authors named *Open Government Objectives*:

- Transparency: Accountability and Public Reuse
- Participation: Citizen Engagement and Citizen Sourcing
- Collaboration: Collaborative Service Delivery and Inter-agency Partnering

This taxonomy distinguishes between two types of transparency (information disclosure): information provision regarding government's internal workings, which is associated with political accountability; and open data and information (as a service) provision, which is associated with efforts to make freely available information collected and produced as part of government functions (e.g., statistics) for public reuse of citizens and companies.

In the context of public administration, a simple definition of *transparency* (for accountability) would be the "unfettered access by the public to timely and reliable information on decisions and performance in the public sector" (Armstrong, 2005). According to Heald (2006), *transparency* is a complex term which can be analysed by means of a set of dichotomies, the major one being between *event* and *process* transparency. *Events*, which can be further divided into *inputs*, *outputs*, and *outcomes*, represent externally visible points/states that are linked by processes. These may be divided into *transformations* (linking inputs into outputs) and *linkage* (linking outputs into outcomes) (Heald, 2006). As objects of transparency, events are (in principle) easily measured, while process transparency is more difficult to assess as it is related to procedural and operational aspects.

Within the same context, *accountability* is often defined as the obligation for public officials to report on the usage of public resources and answerability of government to the public to meet stated performance objectives (Armstrong, 2005; Behn, 2001; Bovens, 2007; Wong & Welch, 2004). Several authors, when analysing the concept of accountability, identify different types and dichotomies (Bovens, 2005, 2007; Sinclair, 1995). Bovens (2007), when discussing "To Whom is Account to be Rendered" (one of the many dimensions by which accountability can be analysed – "the forum"), identifies *political accountability* as involving elected representatives, political parties, voters (citizens), and media. In this context, political accountability is viewed as the counterpart of political delegation: citizens delegate political power and responsibilities to their representatives, which in turn delegate some of their decision power to public officials; representatives and public officials are, in turn, expected to account for their actions by providing the necessary information for citizens to assess their conduct. 'Ordinary' citizens ("members of a society ... not holding office or

administrative positions in government” (Roberts, 2004)) may therefore be considered as the ultimate recipients of accountability related information.

However, ‘ordinary’ citizens might not possess the necessary skills or willingness to directly access and analyse the information disclosed, thus creating a ‘missing users’ problem (Heald, 2012). Citizens then rely on *information brokers* such as journalists, NGOs or even academic researchers, i.e. “those whom Rutherford (1992) described as ‘intermediate users’ of government financial reports and similar documents” (Heald, 2003). Information brokers may therefore be considered as the direct users of public entities’ websites and portals.

1.2 Previous research studies

A stream of empirical works on online transparency assessment has been looking in particular at financial information disclosure, given the impact of financial decisions on public spending, budgeting and taxes. When looking at information disclosure, Internet Financial Reporting (IFR) – see, for instance, (Debreceeny, Gray, & Rahman, 2002; Styles & Tennyson, 2007) – is particularly relevant. IFR concerns both private companies and public entities’ financial reporting, thus providing accountability to citizens. Such works tend to heavily rely on assessing information disclosure against international accounting and financial reporting standards requirements and comparing paper-based (hard-copy) with Internet-based disclosure (Caba Pérez, Rodríguez Bolívar, & López Hernández, 2008; Rodríguez Bolívar, Caba Pérez, & López Hernández, 2007). The assessment is usually based on information qualitative attributes such as completeness, timeliness, comparability, understandability, relevance and reliability (Caba Pérez, López Hernández, & Rodríguez Bolívar, 2005; Rodríguez Bolívar, Caba Pérez, & López Hernández, 2006). While these characteristics are certainly important, putting them at the core of a potential transparency index creates the risk of assuming an excessive accounting/technical perspective, focused on compliance.

Furthermore, most transparency assessment efforts reported in the literature also include analysing website sophistication and technical issues (e.g. navigation facilities, interface usability) using, for instance the Web Site Attribute Evaluation System (WAES) methodology from the Cyberspace Policy Research Group (Pina, Torres, & Royo, 2007, 2010). Often, these efforts comprise the assessment of a *transparency* dimension which is associated to the presence of organizational, contact or ownership information (for instance) on websites, and are not therefore strongly related to *accountability* or *public reuse*.

Whereas easy access to information is certainly a requirement of any type of transparency, these models underestimate the evaluation of access, visibility or usability of the data (as recommended, for instance, by the Open Government Working Group (2007) – Eight Principles of Open Government Data) and include many purely website technical/design aspects (misleadingly under the designation *transparency*). Grimmelikhuijsen and Welch (2012), for instance, developed and empirically tested a Theoretical Framework for Computer-Mediated Transparency using data collected from 80 Dutch municipal websites air quality related issues. While the framework uses a discrete (1/0) indicator for each item disclosed, it does not consider whether municipalities take advantage of the Internet’s potential to disclose such data in a suitable way for downloading and autonomous processing by stakeholders (therefore not taking into account the Eight Principles of Open Government Data).

In short, it is possible to state that not only is the online transparency literature fragmented and still “underdeveloped” (Grimmelikhuijsen & Welch, 2012), but also that empirical studies exhibit some limitations when assessing transparency for accountability:

- Except for the Grimmelikhuijsen and Welch (2012) study, no effort is made to clearly state which type of transparency is addressed;
- Many studies give preference to general website sophistication and technical issues (e.g. navigation facilities, interface usability) assessment, marginalizing the type of information disclosed;
- Most focus on major aggregated budgetary and financial statements qualitative content analysis, looking at compliance with standards and/or comparing them with paper-based reports.

1.3 Aims and objectives

The aim of the current work is to contribute to understanding, in the context of Open Government, whether or not public sector entities take advantage of the Internet's potential to allow citizens to comprehend *where* and *how* public officials use the resources at their disposal (*input transparency for accountability*). In this sense, an assessment model is developed.

The proposed model, although sharing some of the principles underlying the works previously mentioned, is expected to overtake some of their limitations. The assessment model comprises a *Transparency Index* which reflects at what extent the potential of the Internet is being used by public sector entities to disclose detailed (disaggregated) data according to the principles of *Open Government Data*, namely by valuing data visibility, adequate format for further processing, and individual information items autonomous presentation. The model was therefore designed to consider the needs of information brokers interested in analysing such data on behalf of 'ordinary' citizens.

By giving particular attention to detailed (disaggregated) data and to key aspects of data disclosure (those that make data suitable for machine-processing, as suggested in the Eight Principles of Open Government Data), the proposed assessment model is then primarily directed to information brokers interested in analysing the current level of online information disclosure by public sector entities. Therefore, the model aims to assess whether relevant information items are made available ('what' is being disclosed) and by which means ('how' it is being disclosed). However, to clearly understand the model scope, it is necessary to distinguish between:

- 'What' information items are considered relevant;
- 'What' information items are effectively disclosed by each entity;
- 'How' are the items being disclosed.

Accordingly, before the model is applied there is a need for model users (information brokers, as citizens' intermediaries) to define 'what' needs to be disclosed (relevant information items), which corresponds to step 1 of the assessment process described in section 2.2. This paper is focused on the latter two points. The proposed model is generic enough to be easily adapted to different types of public sector entities and contexts, by adjusting the relevant information items, as well as the importance given to each evaluation criterion, that make the *Transparency Index* (see section 2.3).

Next, the proposed transparency assessment model (and the corresponding *Transparency Index*) is explained. To illustrate its application, two cases – regarding Portuguese and Italian municipalities – are presented. Finally, in the last section, conclusions are drawn concerning the usefulness of the proposed model, its future developments, and the policy implications that derive from it.

2 The proposed model and transparency index

It is now possible to clearly state that the current paper is focused on transparency for accountability evaluation within the framework of Open Government. More specifically, it is directed towards the assessment of the disclosure of governmental data intended to support political accountability. Also, according to the dichotomy proposed by Heald (2006), this work is concentrated mainly on evaluating *input (event) transparency*, that is, *how* and *where* public resources are being used.

2.1 The model principles

The proposed model was developed under the following assumptions/aims:

- It analyses exclusively information directly associated with public resources management accountability. Purely institutional (such as public opening hours) and administrative (such as regulations and public services description) information is left out of the analysis process;
- It does not aim at verifying the legal/formal compliance of the information made available, vis-à-vis national and international standards regarding, for instance, financial statements elaboration;
- It does not aim at assessing qualitative characteristics (clarity, timeliness, comparability, reliability, etc.) of the information made available since those characteristics, although extremely relevant, are not directly related with the potential of the Internet as a disclosure platform;

- It aims does not aim at assessing “pure” technical aspects related with website design (such as interactivity or usability), except when directly and strongly related with taking advantage of potential of the Internet as a disclosure platform (limiting the visibility or processing possibilities of the information disclosed).

One very important distinctions of the proposed model from other assessment models described in the literature is related to the information items to consider: our model pays special attention to micro-level (non-aggregated) data (such as contracts, expenses, debts) which supports the usual macro-level (aggregated) traditional statements (such as the annual budget or the balance sheet). In this sense, while drill-down (from aggregated to detailed information) and other analytical operations is extremely difficult to perform when detailed data is made available on paper, the Internet (and digital media) allows business intelligence (analytics) systems to perform such operations. Also, the analysis of a great volume of micro-level, non-aggregated data, is no longer a problem when such data exists on digital support, contrary to hard copies.

Consequently, the proposed model seeks also to assess whether the Internet is being used to make available complementary (detailed, micro-level) information, thus allowing citizens and other stakeholders to make their own analysis.

Regarding websites technical aspects, the proposed model focuses on three characteristics which are directly related to information disclosure potential, and which are used as criteria to assess each of the information items presence on the website. The following were considered:

Visibility (how is each item made visible on the website)

If a certain information item is made available on a website without any link to it, any reference on a menu or site map and without being referred to in a search mechanism, then it could be considered that the item is, effectively, not disclosed. This criterion considers the following issues:

- Whether an autonomous reference (link) to the item exists in the main page;
- Whether a specific area exists, and it is referenced in the main page, which contains the item and whose name points (hints) to the item presence;
- Whether an autonomous reference to the item exists in the site map;
- Whether a search performed in the website, using the item designation, uncovers the item (a reference to the item appears in the results);

Format (of presentation)

To assess each item format of presentation, the model adopted the Eight Principles of Open Government Data proposed by the Open Government Working Group (2007), in particular with respect to the 5th principle (“Data Must Be Machine processable”). This means that public sector entities should make data available in such formats that would allow citizens to easily process and analyse data autonomously, without having to rely solely on aggregated data and analysis offered by those entities. It should be noted, however, that this criterion is only applied to information items which are numerical in nature, and therefore suitable for analytical processing (each item is still assessed in the same way for all entities). This criterion recognizes three possible format options:

- Directly processable (e.g., spreadsheet)
- Extractable (e.g. text document)
- Image (e.g., protected PDF)

Delivery mode

One important aspect to consider when trying to identify and obtain a certain type of information is whether it is made available “on its own” (autonomously), or whether such information is part of a broader document, and it is therefore difficult to find and access. Therefore, this criterion recognizes two possible delivery options:

- Autonomous delivery, i.e., when the information item is made available “on its own”;

- Integrated delivery, i.e., when the information item is made available as part of a broader document which includes several other information items.

In short, the proposed model encompasses a set of three criteria applicable to each one of the information items identified as relevant, so that public officials can be held accountable for their actions towards citizens.

2.2 The assessment process

The model aims at being sufficiently generic so that it can be applied to different types of public sector entities (e.g. central government agencies, regional governments, municipalities, public hospitals, public universities), from different countries and institutional frameworks, this way enabling some comparability among assessment exercises. It should be noticed that each assessment process must adapt the model to the specifics of the type of entity being assessed. In sum, the process should follow these steps:

- Define, for the specific type of entities considered (universe) which information items are relevant in order to make public officials' actions more transparent;
- Identify and characterize which actual entities compose the entire universe of the entity type being considered, including their Internet presence (website address);
- Systematically analyze the website of each entity being considered, in order to determine whether each of the information items is available (or not);
- For those items which are available, assess the way each item is disclosed according to each of the three above-referred criteria (see next section for details);
- Define the importance coefficients assigned to each criterion and compute each entity global transparency index (see next section for details).

In what concerns the definition of relevant information items, information brokers (or those directly using the model) might consider different approaches: the analysis of legal disclosure requirements for the targeted entities; the analysis of previous research literature and assessment exercises; the consultation of expert panels or identified stakeholders. In order to decrease the number of information items to a feasible level, iterative selection techniques (such as the MPM – Multi Pickup Method) might be used. Either way, the process must consider a general guideline: items should be as much detailed as possible ('micro-level' data) and aimed at supporting political accountability. The specific items used in the two applications described in this paper might be considered as an inspiration source for subsequent transparency assessment exercises.

As for the last two steps of the assessment process, they will be further detailed in the next section.

2.3 The Transparency Index

To calculate the *Transparency Index* (TI) it is necessary to define:

- The relative importance of each criterion;
- How to assign a value to each item disclosed on the website according to each criterion, taking into account the assumptions stated in section 2.1.

Although different strategies could be adopted, it is proposed, by default, to consider all criteria (i.e. visibility, format and delivery mode) with the same importance. Additionally, each item disclosed is punctuated from 0 to 1, again by default, according to Table 1.

VISIBILITY [cumulative] ²		FORMAT [mutually exclusive] ³		DELIVERY MODE [mutually exclusive] ⁴	
Item OR Specific Area referenced in Main Page	0.2	Image	0.25	Integrated	0.5
Item referenced in Site Map	0.4	Extractable	0.5		
Item appears when searched by relevant words	0.4	Processable	1	Autonomous	1

Table 1: Transparency index points for each item

The values presented in Table 1 are working examples and reflect the authors reasoning. Others intending to use the model might use different values, as long as the hierarchy and ‘cumulativeness’ of options is respected.

Once all options are defined, the TI for each entity is calculated in the following manner. Considering that N information items are expected to be disclosed, then

$$TI_j = \frac{c_v \sum_{i=1}^N v_{ji} + c_f \sum_{i=1}^N f_{ji} + c_m \sum_{i=1}^N m_{ji}}{3 \times N} \times 100$$

Where:

j is the entity under analysis

i is the information item under analysis (0 ≤ *i* ≤ N)

c_v, *c_f* and *c_m* are the importance coefficients assigned to each criterion (*c_v* + *c_f* + *c_m* = 1)

v_{ji}, *f_{ji}* and *m_{ji}* are each item scores, for each entity, as defined in Table 1.

For a matter of better understanding and comparison of the transparency level, the TI uses a 100-point scale. Higher scores are associated with high levels of information disclosure (transparency).

The model assumes an additive nature in building the *transparency index*. In any case it is possible to interpret separately each of the three criteria of the model.

3 Two application examples

In order to assess the applicability and usefulness of the proposed model, two evaluation exercises were conducted regarding Portuguese and Italian municipalities. Even though they are two groups of the same type of public sector entities, given that both countries are EU Member-States, and therefore have transposed the PSI directive, this exercise was also aiming at providing a ‘snapshot’ regarding the impact of the directive on municipalities online transparency.

To better understand the context of the assessment exercise, Table 2 presents the general legal and institutional framework in Portugal and Italy, resulting, in part, from the transposition of the PSI directive.

² The points accumulate, since one item can be, at the same time, for example, referred to in the site map and searchable by the relevant term. Moreover, the item might not be visible according to these options, so getting 0 points.

³ Each item can be presented either through an image, extractable or processable (by the user) file format.

⁴ Each item can be provided either integrated or autonomously.

Main elements	Portugal	Italy
Commissions for the Access to Administrative Documents	<i>Comissão de Acesso aos Documentos Administrativos (CADA)</i> working under the Parliament	<i>Commissione per l'accesso ai documenti amministrativi</i> - working under the Presidency of the Council of Ministries; <i>Commissione per la valutazione, la trasparenza e l'integrità delle AP</i>
Transposition of EU regulation and other laws on access to administrative documents (particularly those addressing Local Governments - LG)	Law 46/2007, "Access to Administrative Documents Law" – Open Administration is addressed as "access and reuse of administrative documents should be assured in accordance to the principles of publicity, transparency, equality, justice and impartiality" Law 2/2007, "Local Finances Law" – requires LGs to publicize in their websites several financial, budgetary and management statements (Art. 49)	Law-Decree 36/2006 of "Execution of EU directive 2003/98/EC on administrative documents re-use" Law-Decree 267/2000 (and updates) "Unique Text Regulator of Local Governments" – obligation to publish budgets and financial statements (according to regulation on public acts publication) in newspapers together with information on contracts, and to show printed financial documents when asked Law-Decree 150/2009 on "Optimization of civil servants productivity and efficiency and transparency of Public Administration" – imposes publication in LGs institutional websites (in the section "Transparency, evaluation and worth") of information about financial management, costs of services delivered, on wages and consultants

Table 2: Legal and institutional transparency framework

It was under this context that the proposed model was applied to 45 Portuguese and 49 Italian municipalities. To analyse the content of their websites, and calculate the respective *Transparency Index*, 13 items as presented in Table 3 were considered.

Primary information		
Financial	Budgetary	Management
Balance Sheet (a)	Budget (c)	Management Report (f)
Income Statement (b)	Budgetary Control Statements (Expenditure and Revenue) (d)	
	Investments and Activities Plan (strategic medium term plan) (e)	
Complementary (detailed) information		
Gross fixed assets, depreciation and provisions (g)		
Financial participations (capital shares in companies and other entities) (h)		
Budget modifications (i)		
Contracts (current situation) (j)		
Transfers, grants and subsidies (k)		
Debt (loans and other debts) (l)		
Personnel employed (including President and Aldermen) (m)		

Note: To make it easier to analyse the results in the following sections, each item as assigned an identifier (letter).

Table 3: Items selected

These items were selected in accordance to the model principles (see section 3.1) and taking into consideration the legal/administrative differences between Portuguese and Italian municipalities. The goal was

to define a common set of items which were expected to be available on all municipalities' websites. As for the *Transparency Index* calculation, all criteria were considered as having the same importance.

3.1 Portuguese Municipalities

Figure 1 displays the number of items disclosed and the percentage of Portuguese municipalities that disclosed them (from a set of 45 municipalities).

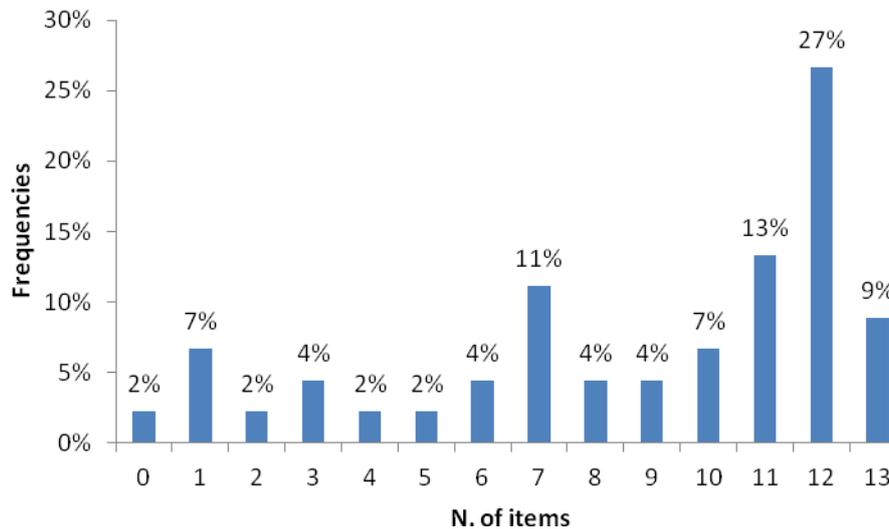


Figure 1: N. of items disclosed (Portugal)

The majority (56%) of Portuguese municipalities analysed disclose 10 or more than 10 items and the average number of items disclosed is 8.73. A maximum of 13 items disclosed is reached by only 4 Portuguese municipalities (9%) while the mode (number of items disclosed by most municipalities) (27%) is 12 items. Only 2% disclose none of the selected items in its website. Figure 2 presents the *type of information* disclosed by Portuguese municipalities.

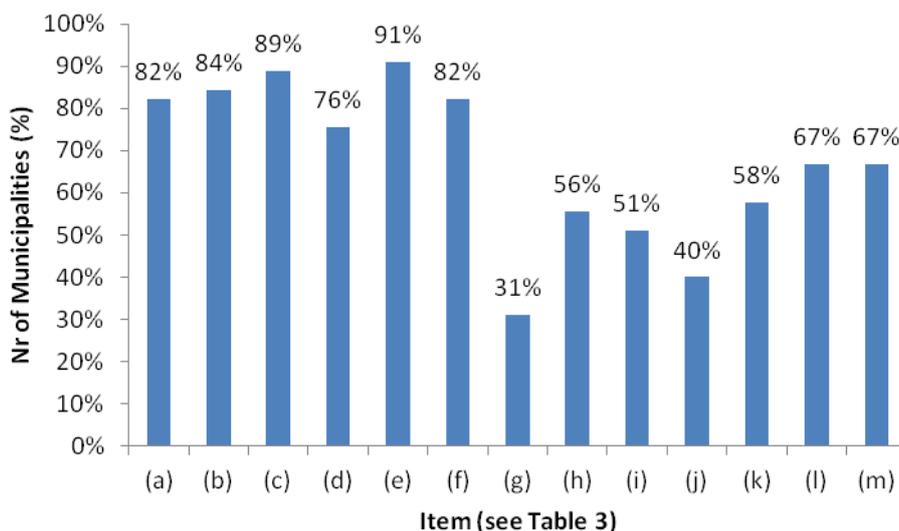


Figure 2: Type of items disclosed (Portugal)

Primary (aggregated) information items are the most disclosed ones, being present in between 76% and 91% of the municipalities' websites analysed. On the contrary, detailed information such as *Gross fixed assets, depreciation and provisions* (g), and *contracts* (j) information is present on only 31% and 40% of all websites, respectively.

The analysis of the websites was completed by calculating the *Transparency Index* for each municipality, which takes also into consideration *how* the items are presented (its visibility within the website, format and delivery mode). Results are presented in Figure 3.

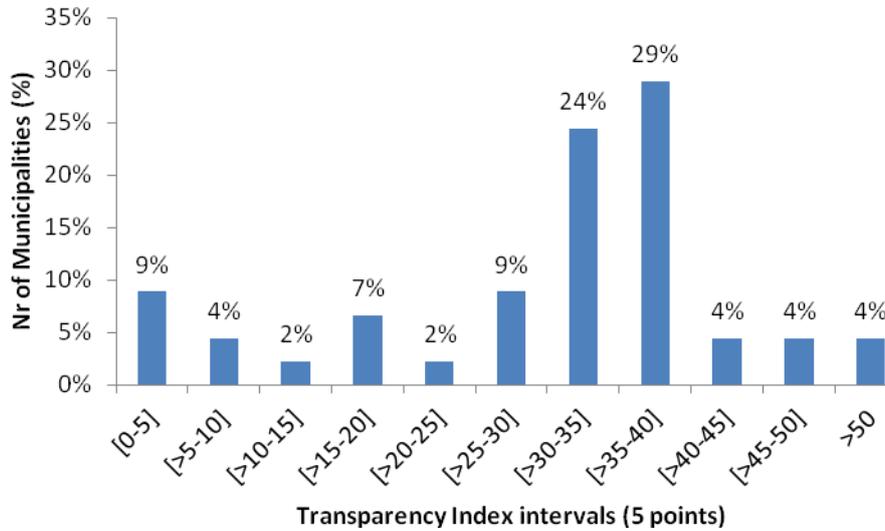


Figure 3: Transparency indexes (Portugal)

According to the assessment model, 53% of the Portuguese municipalities’ websites got a *Transparency Index* value between 30 and 40 points, while 9% score the lowest (less than 5 points) and only 4% (2 municipalities) scored above 50 points (51 and 60 points, respectively).

3.2 Italian Municipalities

Figure 4 displays the number of items disclosed and the percentage of Italian municipalities that disclosed them (from a set of 49 municipalities).

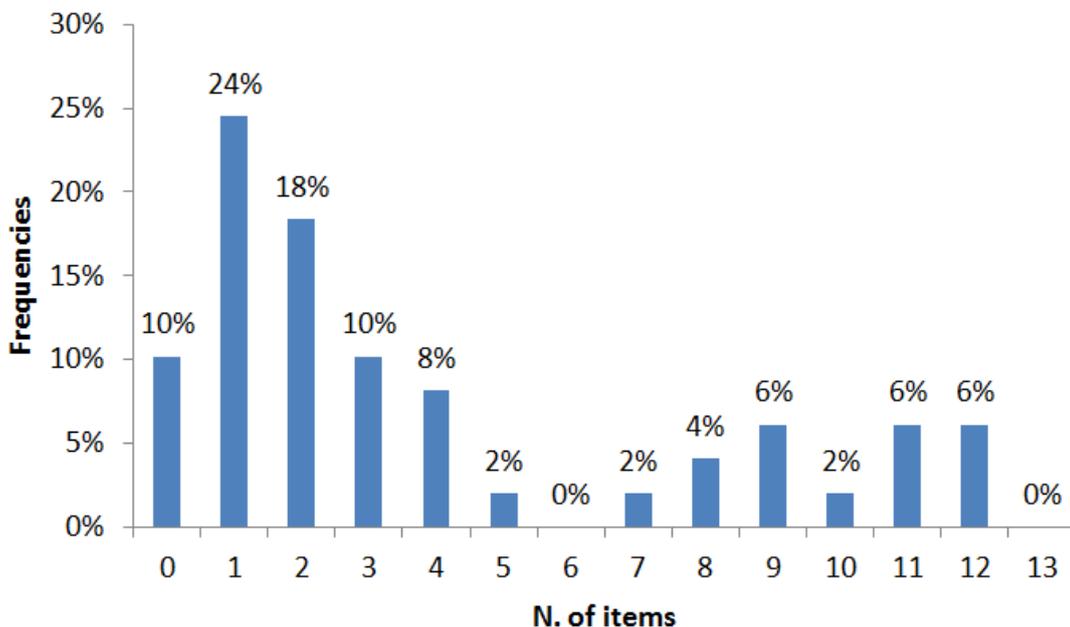


Figure 4: N. of items disclosed (Italy)

The majority (52%) of Italian municipalities analysed disclose less than 3 items and the average number of items disclosed is 3.98. No municipality was found to disclose all 13 items (a maximum of 12 items are disclosed by only 3 Italian municipalities (6%)), while the mode (number of items disclosed by most

municipalities) (24%) is only 1 item. Altogether, 10% disclose none of the selected items in its website. Figure 5 presents the *type of information* disclosed by Italian municipalities.

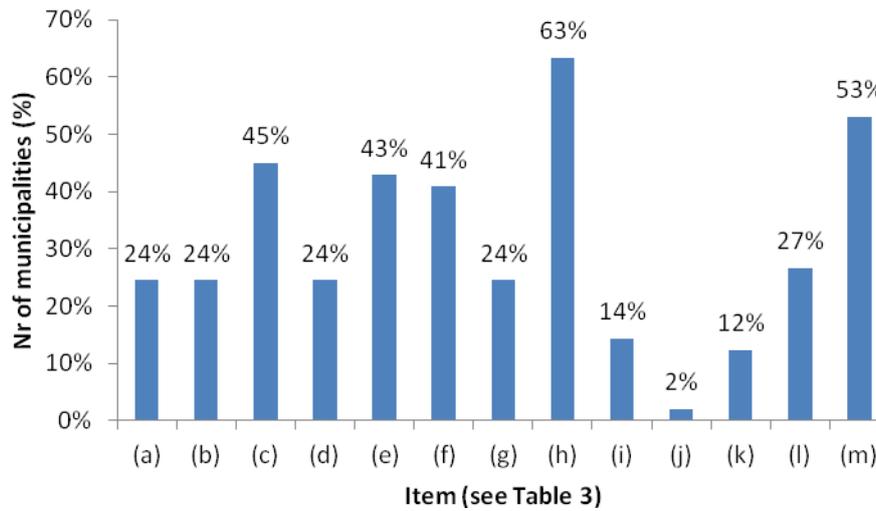


Figure 5: Type of items disclosed (Italy)

According to Figure 5, there is no significant difference between primary (aggregated) and complementary (detailed) information items being disclosed. The most disclosed items are *Financial participations* (h) and *Personnel employed* (m), which were found in 63% and 53% respectively of all websites analysed, both falling into the complementary (detailed) information category. Also from that category, information about *Contracts* (j) is the least revealed (found in only 2% of the municipalities websites analysed).

Again, a *Transparency Index* was computed for each of the 49 Italian municipalities under analysis, and the resulting figures are presented in Figure 6.

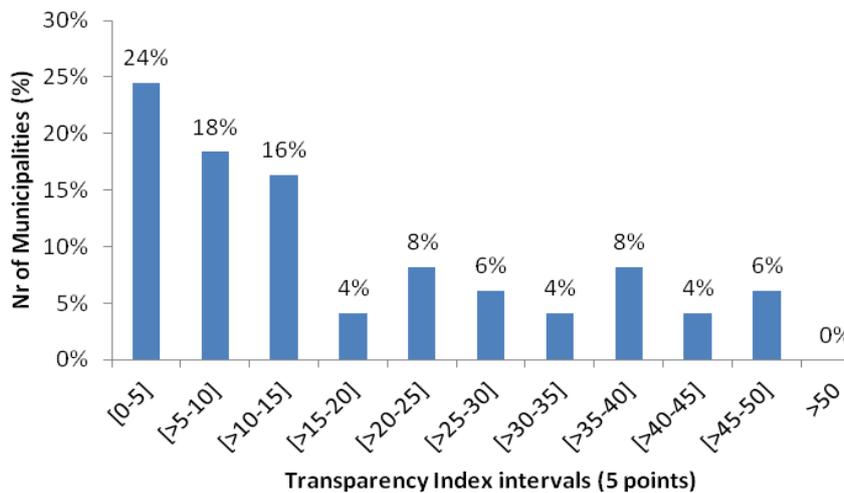


Figure 6: Transparency indexes (Italy)

According to the assessment model, 24% of the Italian municipalities analysed scored less than 5 points, while none scored above 50 points. Also, more that 50% scored less than 15 points.

3.3 Results analysis

In the set of municipalities considered, the index mean value is higher in Portugal (30.35) than in Italy (17.28). This may lead us to conclude that, given our set of items, Italian municipalities seem to be, on average, less transparent and less open than the Portuguese ones. Moreover, the municipality with the highest level of disclosure is Portuguese and there are 5 municipalities in Italy that seem to be ‘completely closed’. It seems that, although several of the items analysed should, by legal imposition, be publicly reported in both countries,

it seems that many municipalities still do not find important to disclose this type of information in their institutional websites.

Results regarding the Portuguese case, in particular, illustrate an important aspect: while Portuguese municipalities do disclose a significant number of the selected information items (Figures 1 and 2), their disclose index is somewhat low (almost all below 50 points). This means that the items are being disclosed but the way they are disclosed is not in accordance with the general Open Data and PSI disclosure principles: information items do not have enough visibility on the website, they are delivered in a format not suitable for machine processing and re-usability (e.g., PDF without any possibility of extracting data), or they are delivered in 'all purpose' documents which makes even more difficult to find and process them. This might be due to the fact that public sector entities are often compelled to publish certified official documents. In particular, access to and ability to analyse detailed (complementary) data would benefit greatly if such data would be available in processable formats (such as spreadsheets) therefore facilitating accountability processes. It seems that the potential of the Internet and of information technologies (in general) is not being used to the full extent to support transparency for accountability.

4 Conclusions

Governments and international institutions have, for quite some time now, put forward several legislative and policy efforts to promote transparency for accountability. Assessing online information disclosure is paramount to evaluate the effectiveness of such efforts. Existing assessment models proposed in the literature give a limited picture of how transparent public entities are regarding their accountability processes, by considering in most cases purely administrative information disclosure and website technical aspects. Often, these models focus on legal compliance and paper-based disclosure comparison, neglecting to evaluate how the potential of Internet (and information technologies in general) is being used to facilitate access to and analysis of that information.

The proposed model focuses on 'what' detailed (disaggregated) information is disclosed and on 'how' it is made available, valuing data visibility, adequate format for further processing, and individual information items autonomous presentation. Given its scope and application process, it can lead to a more accurate picture of how public entities use their websites to disclose input (resource) management data and promote transparency for accountability.

The model purposefully provides a simple analysis tool to assess web-based transparency for accountability. In this regard it may be considered as 'exploratory', and more complex models (considering, for instance, qualitative aspects of data disclosure) could be used to further analyse web-based transparency when an 'acceptable' level has been reached for a particular country and entity type. Further research needs to be done in order to consider the possibility that some data might be disclosed through Open Government portals, requiring a different type of assessment model. As the complexity of the model increases it would be sensible to consider more sophisticated forms of aggregation, other than a 'simple' additive index.

To illustrate its applicability, the model was used to assess online transparency of a group of Portuguese and Italian municipalities. Results suggest that, despite international (EU) and national legislation requirements regarding transparency, both Portuguese and Italian municipalities still did not disclose important (detailed) data necessary for accountability processes. And even when such data are available, they lack visibility, proper format and autonomous presentation in order to facilitate further processing and analysis by interested stakeholders, according to the Open Government perspective.

From our brief examples, some implications for policy might also be derived. Countries need to adopt effective guidelines and legislation (besides policy principles) favouring active disclosure of relevant data (merely guaranteeing the right to information access is not enough). Guidelines should clearly state the type of information to be disclosed, how it should be disclosed over the Internet, and which of technological tools should be put in place to help citizens (or others on their behalf) to perform autonomous analyses. Furthermore, existing commissions in charge of ensuring access to administrative documents should evolve into more pro-active "open government public bodies", such as the Transparency Board in the United Kingdom. Such commissions should also be responsible for issuing the transparency guidelines, assessing the compliance with them, and effectively guaranteeing that those who do not follow them are made accountable.

Simple models, such as the one proposed in this paper, might assist these bodies to monitor online transparency progress. Moreover, by providing comparable assessment results, these models might stimulate public sector entities to become more accountable.

Acknowledgment

This work was partially supported by Fundação para a Ciência e Tecnologia (FCT) under project grant PEst-C/EEI/UI0308/2011

References

- Armstrong, E. (2005). Integrity, transparency and accountability in public administration: Recent trends, regional and international developments and emerging issues *Economic & Social Affairs* (pp. 1-14). New York: United Nations.
- Behn, R. D. (2001). Rethinking democratic accountability. Washington, DC: Brookings Institution Press.
- Bovens, M. (2005). Public Accountability. In E. Ferlie, L. Lynne & C. Pollitt (Eds.), *The Oxford Handbook of Public Management* (pp. 182-208). Oxford: Oxford University Press.
- Bovens, M. (2007). Analysing and Assessing Accountability: A Conceptual Framework. *European Law Journal*, 13(4), 447–468.
- Caba Pérez, C., López Hernández, A. M., & Rodríguez Bolívar, M. P. (2005). Citizens' access to on-line governmental financial information: Practices in the European Union countries. *Government Information Quarterly*, 22, 258–276.
- Caba Pérez, C., Rodríguez Bolívar, M. P., & López Hernández, A. M. (2008). e-Government process and incentives for online public financial information. *Online Information Review*, 32(3), 379 - 400.
- Debreceny, R., Gray, G. L., & Rahman, A. (2002). The determinants of Internet financial reporting. *Journal of Accounting and Public Policy*, 21(4-5), 371-394.
- European Commission. (2010). *The European eGovernment Action Plan 2011-2015: Harnessing ICT to promote smart, sustainable & innovative Government*. Brussels: European Commission.
- European Parliament and Council. (2003). EC Directive 2003/98/EC of the European Parliament and of the Council of 17 November 2003 on the Re-use of Public Sector Information.
- Grimmelikhuijsen, S. G., & Welch, E. W. (2012). Developing and Testing a Theoretical Framework for Computer-Mediated Transparency of Local Governments. *Public Administration Review*, 72(4), 562–571. doi: DOI: 10.1111/j.1540-6210.2012.02532.x.
- Heald, D. (2003). Fiscal transparency: concepts, measurement and UK practice. *Public Administration*, 81(4), 723-759. doi: 10.1111/j.0033-3298.2003.00369.x
- Heald, D. (2006). Varieties of Transparency. In C. Hood & D. Heald (Eds.), *Transparency: The Key to Better Governance?: Proceedings of the British Academy* (Vol. 135, pp. 25-43). Oxford: Oxford University Press.
- Heald, D. (2012). Why is transparency about public expenditure so elusive? *International Review of Administrative Sciences*, 78(1), 30-49. doi: 10.1177/0020852311429931
- Linders, D., & Wilson, S. C. (2011, June 12–15). What is Open Government? One Year after the Directive. Paper presented at the 12th Annual International Conference on Digital Government Research (Dg.o'11), College Park, MD, USA.
- Obama, B. (2009). Transparency and open government. Memorandum for the heads of executive departments and agencies. Retrieved from http://www.whitehouse.gov/the_press_office/TransparencyandOpenGovernment.
- Open Government Working Group. (2007). 8 Principles of Open Government Data, from <http://www.opengovdata.org/home/8principles>
- Orszag, P. (2009). Open government directive. Memorandum for the Heads of Executive Departments and Agencies, from <http://www.whitehouse.gov/open/documents/open-government-directive>
- Pina, V., Torres, L., & Royo, S. (2007). Are ICTs Improving Transparency and Accountability in the EU Regional and Local Governments? An Empirical Study. *Public Administration Review*, 85(2), 449–472.
- Pina, V., Torres, L., & Royo, S. (2010). Is e-Government leading to more accountable and transparent local governments? An overall view. *Financial Accountability and Management*, 26(1), 3-20.
- Roberts, N. (2004). Public deliberation in an age of direct citizen participation. *The American Review of Public Administration*, 34(4), 315-353.
- Rodríguez Bolívar, M. P., Caba Pérez, C., & López Hernández, A. M. (2006). Cultural contexts and governmental digital reporting. *International Review of Administrative Sciences*, 72(2), 269–290.
- Rodríguez Bolívar, M. P., Caba Pérez, C., & López Hernández, A. M. (2007). E-Government and Public Financial Reporting: The Case of Spanish Regional Governments. *The American Review of Public Administration*, 37(2), 142-177.
- Rutherford, B. A. (1992). Developing a conceptual framework for central government financial reporting: intermediate users and indirect control. *Financial Accountability & Management*, 8(4), 265–280.
- Sinclair, A. (1995). The chameleon of accountability: forms and discourses. *Accounting, Organizations and Society*, 20(2/3), 219-237.
- Styles, A. K., & Tennyson, M. (2007). The accessibility of financial reporting of U.S. municipalities on the Internet. *Journal of Public Budgeting, Accounting & Financial Management*, 19(1), 56-92.
- Wong, W., & Welch, E. (2004). Does E-Government Promote Accountability? A Comparative Analysis of Website Openness and Government Accountability. *Governance: An International Journal of Policy, Administration, and Institutions*, 17(2), 275–297.