

# An Online Transparency for Accountability Maturity Model

Rui Pedro Lourenço<sup>1,2</sup> and Leila Serra<sup>2,3</sup>

<sup>1</sup> INESC Coimbra, Portugal

<sup>2</sup> Faculty of Economics, University of Coimbra, Portugal  
{ruiloure@fe.uc.pt}

<sup>3</sup> Universidade Federal do Maranhão, Brazil  
{leila.maria@ufma.br}

**Abstract.** Online transparency for accountability assessment exercises reported in the literature rely solely on the analysis of public entities' individual web sites, measuring the data disclosed and the way it is disclosed, and not taking into consideration the context in which these 'target' entities operate. This paper aims at identifying key contextual elements that may influence the way data is disclosed by public entities in their individual web sites, and therefore should be taken into consideration when designing the assessment models and exercises. The contextual elements identified were organized into an online transparency for accountability maturity model that may be used on its own to assess the overall level of sophistication of a country or region ('context'), or it may be used in a stage-gate approach to define the appropriate type of entities assessment model. Researchers wanting to assess a set of 'target' entities should therefore begin by analyzing the context in which they operate (using the proposed maturity model) and then define their assessment model according to the recommendations proposed in this paper for the corresponding maturity level.

**Keywords:** Transparency, accountability, assessment, maturity model.

## 1 Introduction

The subject of *Open Government* has been emerging as a top topic of interest in Electronic Government Research over the last few years [1]. Meijer et al. [2] emphasize that *openness* includes both the possibility of citizens to monitor governmental action ("vision": *transparency*), but also to influence government processes through access to decision-making arenas ("voice"). As one of the *Open Government* objectives [3], *transparency*, in particular, has also received attention from both academics and practitioners, the later confirmed by the emergence of Open Government Data Portals (such as Data.Gov) worldwide<sup>1</sup>.

---

<sup>1</sup> See <https://www.data.gov/open-gov/> for a list of such initiatives (last consulted in 13-03-2014).

With respect to transparency in the open government context, Linders and Wilson [3] further distinguish between the disclosure of government data aiming to promote its reuse for social or economic value, and data openness with the intent to support accountability of public officials. While the former is more closely associated with the creation of high-profile Open Government Data Portals, this work aims at addressing the latter (*transparency for accountability*).

The concept of *accountability* is very complex and may be understood from many different perspectives. Bovens [4] not only advances a very synthetic description for accountability (“the obligation to explain and justify conduct”), but also proposes several perspectives from which the concept of accountability may be analyzed. From the “To Whom is Account to be Rendered” perspective emerges the concept of *political accountability*, whereby citizens (among others) are the recipients of governmental disclosure efforts as a counterpart for the power delegation which characterizes representative political systems [4]. Open Government in general, and transparency in particular, may be considered an important prerequisite for political accountability because they allow citizens to access the information they need to assess the conduct of public officials responsible for managing the resources at their disposal [4].

While transparency has been associated for a long time with ‘traditional’ (paper based) freedom of information, the technological transformations of the last decades, the Internet in particular, have impacted profoundly the disclosure processes and access possibilities to government information [5]. The relevance of online transparency has led to several assessment exercises reported in the literature (see, for instance, [6] for a list of examples). In these exercises, researchers usually select a set of ‘target’ public entities, define a set of transparency requirements (assessment model) and analyze those individual entities’ web sites to assess in what extent they meet the requirements. The result is usually expressed as a disclosure index, a “single-figure summary indicator” [7] which is considered as a proxy for the entity transparency level.

However, such online assessment models and exercises, by analyzing the individual entities web sites in isolation, do not consider the context in which the entities operate. Such context (country, federal state/region, ...) might condition the assessment models applicable to them. The importance of the context may be illustrated by the emergence of open government dataset portals, and their impact on the way transparency is ‘traditionally’ assessed: data concerning a particular public entity (under assessment) may no longer be disclosed solely at the entity web site. This, and other characteristics of the entities context, creates new challenges to online transparency assessment exercises and ‘traditional’ assessment models may no longer be totally adequate for the purpose. In sum, online transparency assessment exercises can no longer rely solely on entities’ individual web sites analysis and need also to consider the context in which they operate.

Although some maturity models have been proposed in the context of open government (see following section) they do not establish any connection with ‘traditional’ individual entities online transparency assessment models. The goal of this paper is then to close this gap. It starts by identify key contextual elements which may influence the way ‘target’ entities assessing models are defined and applied, and then

proposes an online transparency for accountability maturity model based upon them ('context maturity model'). Instead of just computing a single-figure summary indicator (index) for each entity, with a one-size fits all assessment model that disregards the context in which the entities operate, we propose to use a stage-gate approach: in a first step, the model is used to assess the context maturity level from an internet-enabled transparency perspective (common to all individual entities under assessment); then, depending on the maturity of the context, a specific (more detailed) assessment model ('entities assessment model') is used to provide an index value for each entity. In the end, both indicators (context level and entity index) will form a global assessment of each entity efforts concerning online transparency for accountability. Alternatively, the proposed context maturity model may be used in a standalone basis to assess and compare the development of countries, federal states, regions or any other contextual entities.

The remainder of this paper is organized as follows. The next section will reflect upon some of the maturity models already proposed in open government related literature. This will be followed by a section where a set of key context characteristics relevant to individual public entities online transparency assessment exercises is presented. Then, section 4 presents and characterized the proposed maturity model. The paper will end with some conclusions and reflections about further developments.

## 2 Previous Research on Maturity Models

Maturity models are commonly used to describe or represent the "anticipated, desired, or typical evolution path" [8] of an entity (such as an organization or country) or class of objects (such as processes) over time. In this context, maturity is considered as a synonym of "competency, capability, or level of sophistication" on a particular domain [9]. Although such development path may be represented by a continuous index, usually it is modelled by a discrete staged maturity model [10] and a set of criteria is used to assign each entity to a particular stage at a particular moment ("a snap-shot of the organization regarding the given criteria" [8]). Stages in maturity models are also commonly considered as cumulative, that is, "higher stages build on the requirements of lower stages" [9] as entities progress from the lower stages to top ones. This one-dimensional linear approach to maturity assessment, although simpler, may not be fully adequate to the complexity of the relevant domain. An alternative is to use a stage-gate approach where separate assessment models are used for each of the 'main' maturity model stages [9].

Maturity (stage) models have been proposed for a long time both in the field of eGovernment [11-15], eDemocracy/eParticipation [16, 17], and eGovernance [18]. However, these models focused mainly on the sophistication of online service provision and/or citizens' engagement and participation, reserving a secondary role for information provision and were therefore not aligned with the current Open Government initiatives who put transparency and participation at the heart of eGovernment and eDemocracy.

Recently, an Open Government Data stage model [19] was proposed to address the shortcomings of the previous eGovernment maturity models with respect to online information provision. This model focus specifically on data integration and consists of four stages ranging from ‘Aggregation of Government Data’ to ‘Integration of Government Data with Non-Gov Formal data and Social data’.

In the same context, Lee and Kwak [20] proposed an Open Government Maturity Model to assess and guide the development of open government initiatives with a special attention to the way social media may contribute to increase public engagement. The model follows closely the three main open government objectives (transparency, participation and collaboration [3]) by making them correspond to the three intermediary stages between ‘initial conditions’ (level 1) and the more sophisticated ‘ubiquitous engagement’ (level 5).

Despite these efforts, none of the two previous models specifically address the global aspects of online transparency for accountability assessment, but rather focus on particular aspects of data provision. The proposed maturity model will not only address contextual online transparency (when used in a ‘standalone mode’), but will also serve as a bridge to ‘traditional’ individual entities online transparency assessment models by adopting a stage-gate approach: in the first step the maturity model will analyze the context in which these entities operate and, depending on this first assessment, will then serve as a guidance to develop and apply the appropriate entities assessment procedure. This approach will result in an index value for each entity within the maturity level of the overall context. This way it is possible to avoid unnecessary analysis concerning ‘advanced aspects’ when the overall context is still characterized by a low maturity level.

The next section will present the key context characteristics considered to develop the proposed model.

### **3 Key Context Characteristics**

The proposed maturity model is based on the identification of key characteristics associated with the context in which public entities operate which were derived from literature analysis. These characteristics concern both technological and organizational aspects, and the way they influence and relate to each other.

#### **3.1 Technological Infra-structure**

The first major contextual characteristic which is deemed relevant to the type of online transparency assessment model applicable to individual public entities is a technological one: technical infra-structure. Since online transparency assessment exercises tend to be performed in developed (or, at least, developing) countries, it is almost always taken for granted that a technical infra-structure exists, namely the Internet, over which public entities disclose their data. Moreover, it is usually assumed that most (if not all) entities addressed have a web presence of some sort and that they use such presence to disclose (more or less) relevant accountability data.

Beside the infra-structure itself, other aspects that might be used to characterize the context include broadband internet adoption rate by citizens (the ultimate recipients of accountability data), for instance.

### 3.2 Dataset Portals and Web Sites

An important element that may influence the way individual entities disclose accountability information is related to the existence of external (global) dataset portals and web sites, corresponding to what Kalampokis et al. [21] refer to as “direct data provision”<sup>2</sup>. As part of Open Government initiatives, many generic open data portals, such as Data.gov, were created as aggregators of data that is usually reported by entities on a voluntary basis.

A different type of thematic (more specific) portals has also emerged, such as Recovery.gov [22] or European national sites disclosing data concerning the projects and beneficiaries of the European Regional Development Fund (ERDF) and the European Social Fund (ESF) [23].

Still in this category, another type of portals may be considered, stemming from the way public entities in modern States are organized into *sectors*: clusters of entities grouped together according to their similar legal status (regime), type of services provided, goals pursued, or administrative autonomy. Sometimes these sectors have dedicated portals, curated by a particular supervising entity that collects, processes and discloses data concerning all public entities from that sector. In sum, data portals, either generic, thematic or sectorial, changed the relevant context for accountability data disclosure and should be taken into consideration when performing assessment exercises.

### 3.3 Accountability Networks

In the last decades the structure and organization of modern States changed profoundly as a result, among others, of privatizations and New Public Management inspired reforms [24]. This resulted in a more complex and fragmented State, with a blurred frontier among private and public entities, therefore making it more difficult for ordinary citizens to “comprehend, map and record” the resulting constellations of public entities [24]. These structural changes had also an impact on existing *accountability regimes* (“the sum of a series of interconnected accountability arrangements and relationships regarding a particular actor”) [25], thus leading to dense and complex “networks of accountability” [26].

Under these *accountability regimes*, individual public entities are subjected to administrative and financial supervision and control from auditors, inspectors, controllers and other supervising entities. The existence of such internal (not public), administrative *accountability networks* changed the relevant context for accountability data

---

<sup>2</sup> From the perspective of the entities to which the data belongs, publishing it in a global portal rather than on their own web sites would perhaps better qualify as an “indirect data provision”.

disclosure since entities are now subjected to mandatory data internal disclosure regimes.

This new reality should also be taken into consideration when performing assessment exercises, namely in what concerns the type and amount of data expected to be disclosed publicly on entities individual web sites (at least a subset of that reported through the accountability network, for instance).

### **3.4 Overall Structure and Organization of Information**

An important element of context characterization is related to the existence of overall structures that increase the visibility and access to information, facilitate the organization of the disclosed data by individual entities, and provide the necessary framework and guidelines to such disclosure procedures.

An example of such structures would be Public Sector Information (PSI) catalogues [27], which may include the identification and characterization of public sectors in which the State entities are clustered, and the identification and characterization of all entities belonging to each sector. Other catalogues may exist to list and describe information resources (including open government data portals and individual entities web sites), thus increasing their visibility and facilitating the access to accountability related data.

From a more technical perspective, an example of an overall structure would be the existence of common ontologies which individual entities may use to describe the disclosed datasets (metadata), thus facilitating their search, retrieval and analysis. Yet another contextual element would be the existence of a global Linked Data framework designed to facilitate publishing data on the Web “in such a way that it is machine-readable, its meaning is explicitly defined, it is linked to other external data sets, and can in turn be linked to from external data sets” [28]. With such a framework in place, individual entities would then be able to use it in a more effective way.

In sum, these technological transformations have also changed the relevant context for accountability data disclosure and should be taken into consideration when performing assessment exercises.

## **4 The Online Transparency Maturity Model**

According to De Bruin et al. [9], maturity models may be applied for descriptive, prescriptive or comparative purposes. The proposed maturity model aims to be descriptive in the sense that it could be used to assess (describe) the as-is situation of online transparency development of a particular context for a set of public entities, such as a country or federal state. Similarly, the model may be used to provide a benchmarking baseline among countries (a typical ‘context’, for instance), and as a prescriptive model in the sense that it may be used to provide a framework to develop and implement an online transparency policy. The model assumes that the public entities operate in a political democratic context, whereby a legal and Constitutional

framework exist that protects freedom of information and general access to administrative documents.

Rather than simply using a one-dimensional standalone maturity model, we propose to adopt a global stage-gate assessment approach to structure online transparency assessment exercises in two steps:

- In the first step we take advantage of the simplicity of a maturity model by using it in a preliminary evaluation of the context in which ‘target’ public entities operate;
- Then, a specific assessment model is used to complete the analysis of the ‘target’ entities. Such model considers the potential and limitations of the context, as expressed by the evaluation resulting from the maturity model.

Figure 1 presents the cumulative stages of the proposed online transparency maturity model.

Level 4 – Overall structure and organization
Level 3 – Accountability networks
Level 2 – Data portals
Level 1 – Initial conditions
Level 0 – No technical infra-structure

**Fig. 1.** The Online Transparency Maturity Model

Each stage will be characterized below using the contextual elements identified in the previous section. Also, some of the major implications for online transparency assessment models appropriate for each context maturity level will be discussed.

#### **4.1 Maturity Level 0 – No Technical Infra-structure**

According to Becker et al. [8], “the bottom stage [of a maturity model] stands for an initial state that can be, for instance, characterized by an organization having little capabilities in the domain under consideration.” From the perspective of this maturity model, this means that the context in which the ‘target’ entities operate is characterized by a poorly developed internet infra-structure with few public entities having its own web site. If so, it is perhaps meaningless to conduct online (internet-enabled) transparency exercises and therefore to define and apply any online transparency assessment model. If, however, such assessment is to be performed anyway, the model and procedure used should focus on simple characteristics of online disclosure.

## 4.2 Maturity Level 1 – Initial Conditions

Once the internet infra-structure is in place and entities (both public and private) generally have their own web site, we may consider that the context in which public entities operate has reached its ‘initial conditions’. Other elements to consider when assigning ‘contexts’ to this stage may include the level of broadband access rate by citizens and entities, and other similar indicators.

At this context maturity level, online transparency assessment models should consider solely the data disclosed in each entity web site as each public entity independently discloses accountability related data. ‘Traditional’ assessment models, as described earlier in this paper, fall into this category and therefore should be considered adequate to assess entities functioning in this level of context maturity. Furthermore, such models should not expect individual entities to adopt sophisticated technological approaches, such as the ones associated with Linked Data [28], for instance, to disclose data. Rather, data might be disclosed in a simpler spreadsheet format. Other dimensions of the entities assessment models should also adopt a conservative perspective in what concerns technological and organizational sophistication.

## 4.3 Maturity Level 2 – Data Portals

The existence of open government data portals in the context in which ‘target’ entities operate is a pre-condition for the maturity of such a context to be considered in this level. The Open Government movement has contributed to the emergence of both generic (such as Data.gov) and thematic (such as Recovery.gov) portals. Sector portals have also been created in some countries, but they depend much more on the internal organization of States. Generic data portals usually depend on individual entities voluntary disclosure of data, while thematic and sector dedicated portals are usually associated with some kind of supervising entity (theme or sector) to which individual public entities are obliged to report accountability data. In this case it is up to the entities responsible for these thematic or sector dedicated portals to publish some (or all) of the reported data. From a technological point of view, establishing such data portals does not present a major technical challenge since many open source platforms (such as the widely used CKAN<sup>3</sup>) are currently available.

At this maturity level, online transparency assessment models must take into consideration the existence of these external/contextual data portals, and that entities may use them to disclose some (or all) relevant datasets (either voluntarily or not). Therefore, some of the characteristics of the portals themselves (dataset format, downloading possibilities, ...) must be considered in the individual assessment models corresponding to this stage. In particular, such models should consider how is the data published in such portals visible and referred to (linked) from the entities web sites (that is, the way individual web sites relate to external portals) and how do they deal with the possibility of duplicated data (inconsistency).

---

<sup>3</sup> [www.ckan.org](http://www.ckan.org)



#### **4.4 Maturity Level 3 – Accountability Networks**

This stage presupposes not only that an internal (administrative) accountability network exists for the different types of public entities (even stretching beyond the public sector ‘supervising’ entities) but also that such network is explicit and visible: it is well known exactly what entities are part of the network and what is their role in it. It should also be clear what type of accountability relevant data is reported by each type of public entities through their accountability network.

At this maturity level, online transparency assessment models must take into consideration the existence of such networks and the way they might influence how data is disclosed. In general, such models should consider the accountability network of a particular entity as a reference to what should be available and how by:

- Defining a minimal set of data individual entities should disclose to the public (political accountability), considering that such data is already being produced for internal (network) reporting purposes (administrative accountability);
- Considering that part (or all) of that data is disclosed by the ‘supervising’ entities of the network and not directly in the target entities individual web site.

#### **4.5 Maturity Level 4 – Overall Structure and Organization**

For a certain context to be considered at this top level maturity, the requirements of all previous levels should be fulfilled. However, to reach this level, there needs also to exist an overall structure that gives coherence and connects all the individual elements that characterize the levels so far. This may include a catalogue of all resources relevant for online transparency assessment purposes (according to previous levels), a global ontology and a Linked Data infra-structure.

At this maturity level, online transparency assessment models must take into consideration whether or not individual entities take advantage of these technological elements provided by the context. For instance, each entity, its web site, and relevant data resources disclosed in it, should be visible in the global catalogues mentioned (almost like a Google search engine visibility). Furthermore, individual entities should use the global transparency for accountability ontology to provide standardized metadata for the datasets disclosed which, in conjunction with the adoption of Linked Data principles, should facilitate data search, retrieve and processing.

## **5 Conclusions**

In the last few years the context in which public entities function has suffered the impact of both organizational and technological transformations. The complexity of accountability networks in which entities are inserted, and the emergence of Open Government Data portals, for instance, pose new challenges to the way individual entities may be assessed concerning how they use the Internet to disclose accountability

related data. This means ‘traditional’ online transparency assessment methods that focus solely on the characteristics of individual entities web sites, thus ignoring such transformations in the context, may no longer give an accurate picture of the transparency panorama. Also, since different entities might operate in different contexts (with diverse technological and organizational characteristics), it is not adequate to use a one-size fits all assessment model.

This paper proposes an online transparency maturity model, based on some of the most prominent context characteristics (from an internet-enabled perspective on transparency), which may be used in a standalone manner to assess the context in which entities operate or, in a stage-gate approach, as a first step to define an adequate assessment model for the ‘target’ entities (depending on the maturity of their context).

Like any other maturity model, the advantage of its simplicity may be subjected to criticism. The model steps sequence and cumulativeness represent a certain desired evolution path of sophistication that may not correspond entirely to the reality of some contexts. For instance, a particular country being assessed might exhibit characteristics of several stages or even develop the elements of a top level before the developing the ones in the levels below. Nevertheless, the sequence in which the levels are proposed took into consideration the complexity, (global) scope and impact of the technological and organizational characteristics considered in each level.

The proposed model is intended not only to provide a macro assessment tool applicable to contexts such as countries or federal and regional states, but also to close the gap between this and other micro level (entity level) ‘traditional’ assessment exercises. Therefore, those wanting to initiate individual entities assessment exercises should consider first the level of maturity of the surrounding context, and then adapt the appropriate assessment model according to the suggestions made. In the end, the overall analysis should help both academics and public officials to develop better online transparency for accountability systems both at macro and micro level.

As this maturity model focus on internet-enabled transparency, further research might consider the possible impacts of proactive open government legal frameworks on online transparency maturity. Such proactive policy and legal structures extend beyond the general protection of freedom of information that constitute the hallmark of modern western-like democracies.

**Acknowledgements.** This work has been partially supported by the Portuguese Foundation for Science and Technology under project grant PEst-OE/ EEI/UI308/2014.

## References

1. Scholl, H.J.: Electronic Government Research: Topical Directions and Preferences. In: Wimmer, M.A., Janssen, M., Scholl, H.J. (eds.) EGOV 2013. LNCS, vol. 8074, pp. 1–13. Springer, Heidelberg (2013)
2. Meijer, A.J., Curtin, D., Hillebrandt, M.: Open government: connecting vision and voice. *International Review of Administrative Sciences* 78, 10–29 (2012)
3. Linders, D., Wilson, S.C.: What is Open Government? One Year after the Directive. In: 12th Annual International Conference on Digital Government Research (Dg.o 2011), pp. 262–271. ACM, College Park (2011)

4. Bovens, M.: Analysing and Assessing Accountability: A Conceptual Framework. *European Law Journal* 13, 447–468 (2007)
5. Jaeger, P.T., Bertot, J.C.: Transparency and technological change: Ensuring equal and sustained public access to government information. *Government Information Quarterly* 27, 371–376 (2010)
6. Lourenço, R.P.: Data disclosure and transparency for accountability: A strategy and case analysis. *Information Polity* 18, 243–260 (2013)
7. Coy, D., Dixon, K.: The public accountability index: crafting a parametric disclosure index for annual reports. *The British Accounting Review* 36, 79–106 (2004)
8. Becker, J., Knackstedt, R., Pöppelbuß, J.: Developing Maturity Models for IT Management. *Business & Information Systems Engineering* 1, 213–222 (2009)
9. De Bruin, T., Freeze, R., Kaulkarni, U., Rosemann, M.: Understanding the Main Phases of Developing a Maturity Assessment Model. In: 16th Australasian Conference on Information Systems (ACIS), Australia, New South Wales, Sydney, pp. 8–19 (2005)
10. Klimko, G.: Knowledge Management and Maturity Models: Building Common Understanding. In: Second European Conference on Knowledge Management, pp. 269–278. Bled School of Management Bled, Slovenia (2001)
11. Andersen, K.N., Medaglia, R., Vatrapu, R., Henriksen, H.Z., Gauld, R.: The forgotten promise of e-government maturity: Assessing responsiveness in the digital public sector. *Government Information Quarterly* 28, 439–445 (2011)
12. Andersen, K.V., Henriksen, H.Z.: E-government maturity models: Extension of the Layne and Lee model. *Government Information Quarterly* 23, 236–248 (2006)
13. Layne, K., Lee, J.: Developing fully functional E-government: A four stage model. *Government Information Quarterly* 18, 122–136 (2001)
14. Lee, J.: 10 year retrospect on stage models of e-Government: A qualitative meta-synthesis. *Government Information Quarterly* 27, 220–230 (2010)
15. Siau, K., Long, Y.: Synthesizing E-government Stage Models - a Meta-synthesis Based on Meta-ethnography Approach. *Industrial Management & Data Systems* 105, 443–458 (2005)
16. Tambouris, E., Liotas, N., Tarabanis, K.: A Framework for Assessing eParticipation Projects and Tools. In: 40th Annual Hawaii International Conference on System Sciences (CD-ROM), p. 90. IEEE Computer Society (2007)
17. Macintosh, A.: Using information and communication technologies to enhance citizen engagement in the policy process. In: Promises and Problems of E-Democracy: Challenges of Citizen Online Engagement, pp. 19–142. OECD, Paris (2003)
18. Lourenço, R.P.: From e-Government and e-Democracy to e-Governance: a unified view. In: Janssen, M., et al. (eds.) *Electronic Government and Electronic Participation: Joint Proceedings of Ongoing Research and Projects of IFIP EGOV and ePart 2011*, vol. 37, pp. 345–351. Trauner Verlag (2011)
19. Kalampokis, E., Tambouris, E., Tarabanis, K.: Open Government Data: A Stage Model. In: Janssen, M., Scholl, H.J., Wimmer, M.A., Tan, Y.-H. (eds.) *EGOV 2011*. LNCS, vol. 6846, pp. 235–246. Springer, Heidelberg (2011)
20. Lee, G., Kwak, Y.H.: An Open Government Maturity Model for social media-based public engagement. *Government Information Quarterly* 29, 492–503 (2012)
21. Kalampokis, E., Tambouris, E., Tarabanis, K.: A classification scheme for open government data: towards linking decentralized data. *International Journal of Web Engineering and Technology* 6, 266–285 (2011)
22. Huijboom, N., den Broek, T.V.: Open data: an international comparison of strategies. *European Journal of ePractice* 12, 1–12 (2011)

23. Reggi, L., Ricci, C.A.: Information Strategies for Open Government in Europe: EU Regions Opening Up the Data on Structural Funds. In: Janssen, M., Scholl, H.J., Wimmer, M.A., Tan, Y.-h. (eds.) EGOV 2011. LNCS, vol. 6846, pp. 173–184. Springer, Heidelberg (2011)
24. Heald, D.: Why is transparency about public expenditure so elusive? *International Review of Administrative Sciences* 78, 30–49 (2012)
25. Bovens, M., Curtin, D., 't Hart, P.: Towards a More Accountable EU: Retrospective and Roadmap. Amsterdam Centre for European Law and Governance (2010)
26. Scott, C.: Accountability in the Regulatory State. *Journal of Law and Society* 27, 38–60 (2000)
27. Shadbolt, N., O'Hara, K., Berners-Lee, T., Gibbins, N., Glaser, H., Hall, W., Schraefel, M.C.: Linked Open Government Data: Lessons from Data.gov.uk. *IEEE Intelligent Systems* 27, 16–24 (2012)
28. Bizer, C., Heath, T., Berners-Lee, T.: Linked data – the story so far. *International Journal on Semantic Web and Information Systems* 5, 1–22 (2009)