

# External Audit -A New Open Data Approach

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## Abstract

This article has a double fold aim: (1) a multipleperspective assessment of open government and open data, in the context of the developments of government reform emerging processes, and (2) a research of the impact these concepts internalisation in the operational plan may have on external audit. Defining notes, as well as key elements are delineated relating to the abovementioned concepts, while the new approaches are characterised from the theoretical perspective, with a focus on the change of paradigm they trigger.

From the practical point a view, the article introduces a solution to use open data in an audit model characterised by new audit methods and techniques, mainly based on the information technology (distance audit, online audit, e-audit).

As to the second subject matter tackled in the article, the author proposes an assessment of the impact the adoption and implementation of a new auditing framework, built on open data use, has on government (the article also includes a synthesis of researches and points of view provided by specialised publications).

*Keywords*: open government, open data, public sector, data sets, open data portal, audit models, e-audit

JEL Classification: C54, E62, H68



Openness in government and openness of data represent a coordinated change process in the public sector, which puts citizens' and business environment needs at the core of government and ensures a significant and transforming impact on governments' effectiveness and efficiency.

There is no single accepted definition of open government, though there are many common elements in the currently used definitions, which may be summarised in the following characteristics: *transparency* of government actions, *accessibility* of government services and information, as well as government *response capacity* to new ideas, requirements and needs.

The rocket-like development of information and communications technology made it possible for the government reform process to evolve through a *transition directed towards government and data opening*. This involves material re-designing of the information system (IT), for the latter to be able to satisfy the new requirements – which suppose fundamental modifications(much more than online services provision) and generate benefits for citizens, public sector, business environment and other stakeholders.

The implementation of data opening policies is a key challenge for various domains, such as the political, economic and financial, organisational, cultural, legal ones and mainly involve four major objectives<sup>1</sup>: (1) publishing public information online, in open formats; (2) enhancing public information quality; (3) creating and institutionalising an open government culture and (4) establishing a public policies framework for open government.

# **Current state of knowledge**

This research is based on a wide documentation, being scientifically grounded on a comprehensive and relevant bibliography (listed in the bibliographic references). The bibliography includes books, specialised documentation, articles, studies, legislative acts and standards, both from the Romanian and from the foreign specialised literature. The starting point is the *directive on open government,* adopted by the Obama administration in 2009, which continued the *Open Government Partnership (OGP),* a multilateral initiative launched by the United States president, Barack Obama, and the British Premier, David Cameron, in 2011. The aim of the initiative was to encourage governments to be *as open* and *transparent* as possible relating to their actions. In 2013, the initiative *Open Data Partnership (ODP)* was launched, in the same formula.

In 2012, in Great Britain, the Government set up the *Open Data Institute - ODI* which supports the progress of open data by providing assistance funds for launching, by organising training courses, by certification procedures and conferences. The Government of Netherlands has a significant contribution to the governments opening movement. Currently, 65 countries participate in the *Open Government Partnership*.

The European Union opened the way to the capitalisation of the information generated by its institutions and by the public ones of the member states, together with the opening it offered based on the initiative A Digital Agenda for Europe, included in the Strategy 2020, meant to accelerated the development of high speed Internet networks and allow the public to fully benefit from the single digital market.

The digital agenda is the document mentioning the open data subject, with a strong focus on value adding through the re-use of specific data generated by public administration entities. The European Union (EU) got involved in the provision of a legislative framework which would favour the re-use of public information by issuing *Directive 2003/98/EC on the re-use of public sector information* (the PSI Directive<sup>2</sup> – on public sector information) which provides the way public authorities are to make documents available for re-use and offers a series of criteria applying to public sector institutions.

The Decision of the European Commission on the reuse of the Commission's documents 2011/833/EU, is one more step towards the building of "a data portal as a single access point to documents available for re-use".

In 2013, *Directive 2003/98/EC* was modified and approved by the European Parliament and the Council, based on the *Directive 2013/37/EU*, which provides the

<sup>&</sup>lt;sup>1</sup> Open Data Initiative, http://www.whitehouse.gov/open

<sup>&</sup>lt;sup>2</sup> Public Sector Information

obligations relating to access to documents or the obligation to allow the re-use of documents and recommends: sharing of information by electronic means, proposes a minimum set of rules to disseminate the information generated by public institutions and by government agencies and lists the rights of individuals and legal entities relating to re-use. The review also aims at stimulating public sector information use in the business environment and a consistent approach at the level of the Community market.

The Commission also stated its total involvement in the development of a European strategy for the publishing and re-using of public sector data resulting from the activity of European institutions and of the member states, by publishing the data sets proposed and held by the very European Commission. This action was meant to offer as an end result an implementation of a *Commission open data portal*, as well as a set of support type services for the operation of this portal, on a platform which shall gather 39 European countries. Through the intermediary of the open data portal, the European Commission intends to capitalise on public data economic potential, which is estimated at over 40 billion Euro a year, earnings resulting from the re-use of public data.

Directive2007/2/EC of the European Parliament and of the Council on the setting up of an infrastructure for space information in the European Community (Inspire), providing EU member states are to make available geographic information on 34 themes, while their harmonisation should allow for re-use of data through open standards, is a telling example of EU granting a legislative framework on the provision and use of open data. This would lead to the establishment of a genuine single market for digital content and online services (safe and borderless EU web services and digital content markets), enjoying a high security and confidence level, a balanced regulatory framework with clear cut rights regimens, the consolidation of multiterritorial licenses, an adequate protection and remuneration for right holders and an active support in view of the digitalisation of the rich European cultural heritage and internet global government modelling. Furthermore, modern and accessible online services development and use is promoted.

Romania's joining, as of 2011, the Open Government Partnership materialised in the initial engagements, taken based on the Memorandum for the approval of the first *National Action Plan* (July 2012 – June 2014), which resulted in measures relating to public data opening and encouraging of the dialogue between the public administration representatives and the civil society. Currently, the second *Action Plan* is being implemented (July 2014 – June 2016), which re-asserts Romania's engagements relating to the observance of the *Open Government Partnership's* basic principles.

A series of preliminary activities were conducted to launch the Plan: organisation of public debates on open administration and government, in which participate representatives of the administration, of civil society, of the public and private sector, of the academic environment and of other stakeholders, as well as the launching of the *Open Data Coalition*, made of five non-government organisations which promote data publishing in open format.

The favourable legal framework for open government in Romania was strengthened by the adoption of *Law no.* 109/2007 on the reuse of public institutions' information, as a result of Romania's accession to the European Union.

In point of open data provision and use, *supreme audit institutions* find there is an increased interest in studying the implementation requirements and conditions relating to an associated methodological and procedural framework for audit, as well as for the quantification of the effects triggered by open data (including by establishing assessment instruments).

After launching open government and open data partnerships, supreme audit institutions from the countries which underwent a significant progress in the government and data opening (for example, Great Britain and the Netherlands)unfold audits to assess the stage and modality to implement government programmes relating to this domain, which are detailed in the article:

1. The National Audit Office of the United

**Kingdom**<sup>1</sup>, NAO-UK, published two reports on government and data opening, in 2012: (a) Report on the British government open data project and (b) Report on implementing transparency, a crossgovernment review:

<sup>1</sup>National Audit Office –UK





 a) In the first report, NAO made an assessment of the project stage, referring to the following issues: data sets, costs, concern for citizens, stimulation of business environment innovation, opportunities.

Mention shall be made that, in keeping with this report, the United Kingdom has 8,300 data sets, as compared to the 5,786 data sets on the American executive portal, which probably makes it the largest *open data portal* of the ones held by governments worldwide.

b) In the second report, Cross-government review - Implementing Transparency, drafted in 2012, the National Audit Office of the United Kingdom introduced the results of a performance audit on transparency promotion (as a result of data opening) within the Cabinet Office (the most advanced, in the Open Data Barometer), highlighting, on one hand, the activity results in point of value for money and, on the other hand, the impact which transparency promotion had on the public.

The United Kingdom government conducted coordinated actions to promote transparency at economic level; these contributed 16 billions of pounds sterling a year, at the level of 2012, to the economy of the United Kingdom, which reflected the fact that *public data have an economic* value and the capacity to contribute to the maximisation of the economic growth.

The significant increase in the quantity and diversification of public sector information types supported the ever greater responsibility objectives relating to the improvement of public services, focussing on services quality and, implicitly, on their respective *social* value. *The public government value* was reflected in the enhancement of accountability, transparency, response capacity and democratic control.

#### 2. The Netherlands Court of Accounts closely followed the Netherlands' government evolution, which recorded a remarkable ascension in point

of government opening and data opening. Furthermore, the Court assessed this issue in an international context and the position of Netherlands in relation to other advances states and drafted two reports on their own assessments, in 2014 and 2015.

Thus, as compared to 2014, the available open data level did not increase substantially, and public institutions use their own sites instead of the open data government portal, which results in the fact that data become *fragmentary and biased*, and access is not made through a *single contact point*. Furthermore, there are no data relating to government processes and to public finances, data which would allow the public to monitor their own government (hence, an information transparency deficit).

In the instance of open data on public expenditure and performance data, the government offers the possibility for a better visualisation of the own cash flows and of public services quality. This also helps the Parliament monitor open data referring to internal operation of government organisations, operate comparisons among them and identify opportunities for savings. Moreover, certain reports may offer a perspective on income and expenditure for a series of costs standard categories.

In point of international situation, the Netherlands Court of Accounts mentions, as an instance of good practice, the example of Albania, which transparently publishes as open data, through the intermediary of the Central Treasury, *information on public expenditure at transaction level*.

To illustrate information availability, we hereunder present an open data provisions diagram, as data sets pertaining to the following domains: legislative, education, public transport, budget, environment, criminality, international commerce, land fund, chamber of commerce, health, expenditure. In relation to criteria, the Netherlands is in the top five (*census.okfn.org*) or the top ten (*opendatabarometer.org*). **Figure 1** reflects the scores for open data provisions in several important domains (2013).



### Figure 1. Open data availability in 2013 (opendatabarometer.org) – for the Netherlands



Source: The Netherlands Court of Accounts, Report on Open Data trends, 2014

## **Research methodology**

Research conducted to design a new external audit model, associated to the paradigm change resulting from the open data oriented approach (which is in itself a research subject matter), fall under the category of advanced research and focus on the content modifications of certain *classical* audit stages (mainly, audit planning and execution), involving re-engineering classical auditing architectures and of the classical methodological and procedural framework. The article proposes, in an original approach, a new external audit model, based on open data usage; the model proposed implements procedures which mainly use information and communications, for the access to and re-use of public institutions' open data, available on the government portal (www.data.gov.ro). This model also implements advanced distance audit methods (online audit, e-audit).

The documentary research also included studies and analyses of the conceptual framework, reference architectures, specific techniques, as well as particularities which introduce radical changes in the conduct of audit missions in a digital environment. The research having as an object open data use in external audit were launched subsequent to the mentioned orientations and concerns relating to these subject matters around key international events: the 9th EUROSAI Congress<sup>1</sup> (Hague, Netherlands, 2014) – the main theme of which was innovation, and the 8th EUROSAI-OLACEFS Conference<sup>2</sup> (Quito, Ecuador, 2015), with a special focus on supreme audit institution role in supporting the steps to promote governments and data opening, transparency and good practices at public administration level.

As to research stage, open data practical implementation and assessment context, investigations were made of research reports and articles drafted by the European Union or international institutions which are advanced in this field, as well as domain specific assessment methodologies and instruments.

<sup>&</sup>lt;sup>1</sup> European Organisation of Supreme Audit Institutions

<sup>&</sup>lt;sup>2</sup> INTOSAI regional groups of Europe, Latin America and the Caribbeans; a delegation of the Romanian Court of Accounts participated at this event



The results of the scientific approach shall be materialised in the creation of an original methodological, procedural and instrumental framework for external audit, based on the use of open data, compatible with the international scientific level, which can be capitalised in practice by the Romanian Court of Accounts, as well as in the scientific collaboration and cooperation in the field of audit with peer supreme audit institutions.

The article presents and analyses highly interesting and topical subject matters and proposes practical and original solutions for a number of issues tackled and contains both fundamental research items and applicative research ones. The subject matter is dealt with from the point of view of the impact open data use has on external audit, as well as finding this approach's impact at social and economic level.

## Open data use

Open data represents information or recordings stored electronically (documents, data bases with contracts, hearing transcripts and events audio/visual recordings) and are often associated to public authorities' activities transparency requirements. Open data represents the most modern international framework and standard for the definition of transparency specific to good government. These are easy to read data, which can be re-used on the computer, with no restrictions. In the instance of public data, it is provided free of charge and may be generated by a wide range of actors: government, public sector, business environment and public.

From a conceptual point of view, data can be seen at the lowest generalisation level, where information and then knowledge are derived. The phenomenon involving amplification of data volume and organisation of such in *data massifs* resulting from available data sets generated from various sources, made users more aware of the value which can be obtained by combining and connecting different data sets, generated by different actors, both from the private environment and from the public sector.

Why should government data be open? Here are three key reasons: transparency, clearing the social and commercial value and participative government.

The focussing on social and economic value of data signals a change in paradigm of the economic model, as compared to the one based on data use value,

significant in volume, dynamics and variety of information.

# Model of open data based external audit

In the context of open government and of government data, supreme audit institutions are called to play a vital part in at least two senses: (1) *auditing of the way in which government programmes and projects relating to opening were implemented*, and (2) *the use of open data sets as input data in audit activities*, in various domains (finances, healthcare, culture, environment, local administration etc.) and in various audit categories (the level of audited entities and types of audit are to be adapted accordingly).

Audits could answer, subsequent to data sets analysis, a series of questions of genuine interest for the public:

- How is money spent in the public administration;
- Whether funds are exhausted;
- Which are the payments for various services;
- How much money is received from a specific institution, in a certain time frame;
- How much money is spent in each institution;
- How much money is spent in each institution in a certain period.

The auditing architecture proposed in this article represents an original project, which involves major changes in external audit approach, with a double impact: both concerning audit management and auditor's role, and concerning the methodological and procedural plan. A significant part of the classic audit procedures shall be replaced with procedures capable to insure electronic documents auditing (as open data), which require specific treatment procedures. This approach involves major risks, mainly devolving from the de-materialised character of the information contained in the open data sets.

The implementation of the new audit model needs to consider a wide range of specific issues associated to this domain, which requires a special processing: ensuring open data quality, preparing auditors for this approach, re-designing audit management, audit quality assurance, granting the instrumental and methodological support for auditing, information security, systems continuity. The general auditing architecture based on the use of open data published on government portal, proposed by the author, is featured in Figure 2. The associated functionality is implemented by means of a generic three step procedure:

 The audit team using the IT infrastructure of the Court of Accounts collects information relating to the auditee directly from the government portal www.data.gov.ro (Open Data Portal), where data sets provided by public entities are published.



- (2) In relation to the audit objective, information obtained as re-usable data – is analysed and processed, establishing a preliminary support for findings wording.
- (3) Audit findings shall be consolidated with the help of the information collected from the websites of public institutions involved in the audit or on site.

This audit architecture supports the implementation of modern audit methods: *remote audit, online audit, ongoing audit, e-audit.* 

#### Figure 2. General auditing architecture based on open data



Source: Own projection

From the operational point of view, the audit model has two associated functional component parts: (1) auditing the implementation of government programmes and projects relating to open government and open government data and (2) open data sets based auditing. These component parts may be approached in an integrated manner or independently.

The implementation of an auditing architecture based on open data has a special impact on the audit activity organisation and monitoring, as well as on the auditees, among which the most significant ones are: (a) real time information provision; (b) timely detection of errors through rapid information correlation; (c) obtaining richer and more relevant information, through data sets investigation and aggregation; (d) audit activity modernization: procedures standardization, content and work style change, mentality changes, audit quality enhancement; (e) a higher efficiency in reports submission; (f) training staff in modern technologies; (g) changing activity nature through automation of certain procedures; (h) enhancing audit effectiveness and quality through information technology use.

Here is a brief analysis of the operational parts of the open data based auditing model.



### 1. Auditing the implementation of government programmes and projects relating to open government and government data

Auditing the implementation of government programmes and projects relating to open government and government data represents (or, in any case, should become) a key contribution to the support and actuation of governments in satisfying the imperatives of governing and, implicitly, in implementing the priority desiderata of communities and citizens and it is conducted under the form of a performance audit. The main objectives include: enhancing accountability in public funds management; ensuring transparency of government operations; stimulating economic growth; improving government administration services and response capacity; enhancing public relations and the latter's attitude towards the administration; enhancing government data and processes quality through fostering data re-use.

### 2. Using open data sets in auditing

A series of hypotheses and conclusions, more or less general or applicative in kind, may be drafted by synthesising the issues in the previous sections, relating to open government data development impact on audit types and architectures:

- a) Considering the incipient stage and the maturity of open government implementation and of open government data supply, as well as the stage in which data infrastructures and sets are established, no reference approaches or models pertaining to supreme audit institutions were identified yet concerning *the* open data sets use relating to various domain (finances, health, education, culture, environment, local administration etc.), as input data in audit activities.
- b) However, assessments relating to adequate work flows granting collection, integration, validation, circulation, updating and promotion of data re-use or supporting data re-use in audits frameworks can be signalled. Moreover, data sets may be analysed (used) to assess compliance with principles on open government data.
- c) Data sets of public institutions included in the government open data portal represent a *complementary data source* for audit, which can provide, in principle, information of a wide diversity on an auditee. Furthermore, through an adequate reuse, data sets belonging to different domains may be combined according to the aim envisaged, and lead

to conclusions the complexity of which could not be attained through classical auditing. *Cross audits* may be conducted in this way, using open data. Depending on the audited period, certain parts of the audits may be conducted from a distance, thus reducing the duration of field work.

- d) Open data based auditing may be conducted, as a general rule, as follows:
  - 1. Auditing open data sets provided by an entity (the set contains data relating to a well defined field: finances, healthcare, education, statistics, transports, social assistance, labour force, cadastre and others). The aim of the audit is to establish findings and conclusions, obtained based on the *data set analysis and processing*, from the perspective of criteria imposed by audit objectives and by the specific character of the audited domain.
  - 2. Auditing recordings stored in open data sets coming from heterogeneous sets (various entities). The audit is aimed at drafting findings and conclusions obtained following the analysis and processing of individual data sets and of a series of logical combinations of the latter, from the perspective of criteria imposed by audit objectives and by the specific character of the audited domain. Subsequent to results analysis and interpretation, based on audit imposed criteria, new data sets are obtained, which can be compared based on human interpretation, so as to detect possible irregularities or inconsistencies. Discrepancies processing is conducted through the analysis of the new data sets and the interpretation of results to identify discrepancies or incongruities as compared to the expected result. In many instances, it is necessary to conduct additional investigations by consulting additional data sets. Following investigations of data sets, all information required is obtained (including historical ones), in order to pass judgement on operations legality. The conclusion of investigations is concentrated on: analysis, correlation and interpretation of findings and wording of conclusions and recommendations.

In order to launch open data based audit missions, one should firstly establish *the reliability of the data sets used in the audit and the certification of the digital content*. One of the audit objectives is to analyse the factual situation of the data sets which can be candidate to uploading on the open data portal, to establish the reliability of data for each of the sets, whether they are adequate from the point of view of exhaustiveness, correctness, updating, whether they are collected at the source; whether they are timely available; accessible; allow machine processing; all available to anyone, without discrimination or ownership right, whether they are license free. That is why, audit missions need to include a review of compliance principles relating to open data.

Fiscal evasion prevention and fight, respectively ensuring conditions to integrally and timely collect revenues at the state budget, by stimulating development and extending use of open data relating to taxpayers goods and revenues, represent an extremely important issue and a field in which ample audits can be conducted, through the use of data sets of public administration institutions holding information on tax payers. Such an audit represents a complex model for the capitalisation of open government data, with a significant favourable impact on the economic value and social value, obtained through the use of open data.

Conducting an audit on the use of open date in view of managing, sharing and administering tax information (required by ANAF) aims at: the efficient recovery of past due debts, as well as at preventing and fighting tax evasion, respectively insuring the conditions to integrally and timely collect revenues to the state budget. Since in the subsidiary it aims at accelerating the implementation of programmes which would allow establishing measures to support defaulters, on the one hand and to effectively recover past due debts, on the other. In this context, the audit mission would also represent an assessment and a stimulation of the factors involved in the fiscal system reform and management, in point of the latter's stability enhancement, by clarifying certain methodological issues and the procedures enforced through a better monitoring, by accelerating programmes implementation, which would allow for the use of public institutions' open data.

By combing information from data sets and the analysis of results it is possible to identify and put into place the best foreclosure procedure.

Auditing based on open data use will provide significant benefits: abatement of overall costs through re-use, diminishing of audit duration, enhancement of audit effectiveness, obtaining data available for re-use.

Intensive and extensive use of open data in the audit process above will have a positive impact on the results obtained in the tax evasion fight and in corruption prevention, materialised through:

a) Enhancing management procedures and increasing their performance;



- b) Improving budget revenues collection;
- c) Updating fiscal control, including by applying computer assisted audit techniques;
- d) Updating the technique to select taxpayers (based on risk analysis) and inspection procedures
- e) Extending the channels to obtain information and enhancing systems to operate them;
- f) Stimulating actors involved in the reform and management of the fiscal system, both to enhance stability and to better monitor it;
- g) Modernization and technological innovation;
- h) Promoting transparency and preventing corruption.

This new audit model represents a major challenge for the Court of Accounts, considering that the use of open data sets shall generate changes of the current auditing model, both concerning the audit object (*which devolves from the extension of electronic document flows*) and the content of auditing processes (*which involves new*, *computer-based auditing methods*).

### **Conclusion**

The adoption and implementation, by the Romanian Court of Accounts, of an auditing model based on the use of open data will create the premises for the use of modern audit methods, built on remote access to auditees' data sets (online audit, e-audit).

The requirements and transformations highlighted, which shall bring about substantive quality modifications in the external audit approach, need to be supported by *a new strategy of external audit institutions*. The main objective of such a strategy is the setting up of the official framework for the evolution towards the new external audit paradigm (the characteristics of which were synthetically introduced in this article), as well as the adequate work framework for the implementation.

The capitalisation of open government data, including at the level of wide-ranging audits, also has a significant favourable impact concerning the economic value and the social value obtained through the use of open data. Mention shall be made in this respect, for exemplification purposes, of a very interesting subject matter: the prevention and fight of tax evasion, respectively insuring the conditions for the integral and timely collection of revenues at the state budget, by stimulating the development and extension of the use of open data on tax payers' assets and revenues.



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