Open Government Implementation Model

Implementation of Open Government
Version 2.0

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Version  Author       Note
1.0    BK/TP          First draft for publication 13 July 2011
1.1    BK             Incorporation of the feedback from the Environment Agency Austria, Department for Data Management & Reporting: Christian Ansorge, Andreas Berthold, Günter Pfaff, Rudolf Legat, in particular the new criterion "Corporate Reference" Excel table Open Government Data Monitoring also in Open Document format
2.0    BK/TP/BL       First draft for publication at the OGD conference on 4 October 2012
2.0    Brainstorm     English translation published on 30 November 2012

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This document is available at http://www.kdz.or.at/de/open-government-vorgehensmodell.
I Open Government Strategy

1 Introduction

The KDZ - Centre for Public Administration Research was contracted by the Chief Executive Office of Vienna to contribute to the Open Government strategy of the City of Vienna. In order to bring the insights and propositions gained to the attention of a wider public, the Open Government Implementation Model in version 1.0 was published and complemented by suggestions of the Environment Agency Austria in version 1.1.

The now available version 2 is more than a mere document update; it is also a complete revision with a different focus. Version 2 aims to achieve the following goals in particular:

1.1 Focusing on the Implementation Model

A central question to version 2 is: "How should public administration agencies proceed in the implementation of Open Government?"

Particularly, the first stage of the Implementation Model was described in more detail and the subsequent three stages roughly drafted.

1.2 Avoiding redundancies with regard to general subjects

In version 1, elaborated in mid-2011, it still made sense to discuss general subjects, like terminology, motivation and goals, stakeholder analyses, etc. This content is still available in version 1.1. But, in the meantime, many other sources have become available that cover these important aspects comprehensively.

- "Open Government Data Studie Schweiz": [http://opendata.ch/2012/07/05/ogd-studie-schweiz-verfugbar-download/](http://opendata.ch/2012/07/05/ogd-studie-schweiz-verfugbar-download/)
2 Summary

Open Government is the comprehensive redesign of politics and administrative activities according to the principles of modern Public Management and Public Governance. In terms of the above, Open Government focuses on transparency, participation, and collaboration. The KDZ Implementation Model is based on and significantly elaborates the "Open Government Implementation Model" by Lee/Kwak.

Figure 1: Open Government Implementation Model, overall view


In the Implementation Model, **Open Government Data is the first of four stages:**

- **Stage 1 – Increasing Data Transparency:** Opens access to administrative data.
- **Stage 2 – Improving Open Participation:** Opens government and administration for the ideas and knowledge of the public.
- **Stage 3 – Enhancing Open Collaboration:** Improves Open Collaboration between administrative agencies, the government, citizens, the public, and the economy. Open participation allows the use of social media to connect people and their ideas. Open Collaboration allows the achievement of specific outputs.
- **Stage 4 – Realizing Ubiquitous Engagement:** Allows the engagement of the public through transparency, participation, and collaboration.
The Implementation Model is now so detailed that guidelines for Stage 1 are now available. The further stages are not yet available in equal detail, but there are first approaches and practical examples that allow politics and administration to take the next steps forward.

Politics and administration must develop a comprehensive Open Government strategy; this document provides a contribution thereto.

3 Outlook

Two significant developments should be emphasized when taking a comprehensive view of Open Government: the issue of Data Governance and the relationship between Open Government and Public Governance.

3.1 Data Governance

A focused look at public sector data management has been missing so far in Public Management. A control gap has become evident due to the trend toward the release of data in Open Government Data Portals. The Implementation Model is a contribution toward closing this gap.

Producing data catalogues, implementing evaluations in the context of internal data monitoring and the planning and implementation of approval cycles in the first stage of Open Government constitute a contribution to Data Management and Data Governance as new disciplines of Public Management, which only in recent years have become established in the private sector.

Figure 2: Data Governance

![Data Governance Diagram]


1 On the relationship between Open Government and Public Management, see also Krabina, 2010 and 2011.
Further to this, the following resources merit mention:

  [http://www.dama.org](http://www.dama.org)
- Framework for Corporate Data Quality Management. EFQM and the Institute for
  Information Management of the University of St. Gallen (IWI-HSG).
  [https://benchmarking.iwi.unisg.ch/Framework_for_CDQM.pdf](https://benchmarking.iwi.unisg.ch/Framework_for_CDQM.pdf)

The correlation with Corporate Data Quality Management (CDQM) is particularly interesting in this regard, because the Common Assessment Framework (CAF)\(^2\) as instrument for the promotion of quality management in public administration is derived from EFQM.

The key distinguishing factor from private sector activities is the Open Data aspect – i.e. the open and (mostly) free release of this data. This aspect plays a subordinate role (as yet) in private sector economy, because in this environment, data generally constitutes one of the most carefully guarded resources.

The public sector can provide leadership in this area, because the release of data as a source of generating added value by companies also constitutes a new discipline.

### 3.2 Open Government and Public Governance

Open Government aims to achieve the ubiquitous engagement of stakeholders (Stage 4). This is achieved through transparency (Stage 1), participation (Stage 2), and collaboration (Stage 3). The governance debate of recent years has also emphasised this aspect\(^3\). The reference to the Policy Cycle (see Stage 4) illustrates that the different approaches come together in the Final Phase of Open Government: In particular, the Policy Cycle illustrates, **where** (i.e. in which phases of the policy process) participation can be effectively considered and implemented, while the **Open Government Implementation Model** shows **how** (by means of what measures) participation can be achieved. The multi-stage approach also demonstrates how transparency, participation and collaboration build upon and are contingent on each other. More details on this will be contained in the KDZ publication “Offene Stadt. Wie BürgerInnenbeteiligung, Bürgerservice und soziale Medien Politik und Verwaltung verändern”.

Aside from the aspect of Open Government Data that is currently in the focus of interest, the next stages of the Implementation Model scheduled for the coming years nationally and internationally promise to remain particularly exciting. In this area, society as a whole is undergoing a learning process on the road to Open Government.

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\(^2\) See [http://www.caf-zentrum.at](http://www.caf-zentrum.at) [download: 27 September 2012].

\(^3\) For details see Bauer; Dearing: Public Management und Governance, 2011.
II Open Government Implementation Model

The "Open Government Implementation Model" is a generic procedure model for the implementation of Open Government initiatives (see Figure 3). It contains proposals for a step-by-step implementation of Open Government and includes indicators for measuring the success of the individual steps. The following section will introduce the model, adapt it to circumstances and requirements in Austria and expand it in terms of content.

Figure 3: "Open Government Implementation Model"

- **Stage 1 – Increasing Data Transparency**: Opens access to administrative data.
- **Stage 2 – Improving Open Participation**: Opens government and administration for the ideas and knowledge of the public.
- **Stage 3 – Enhancing Open Collaboration**: Improves Open Collaboration between administrative agencies, the government, citizens, the public, and the economy. Open participation allows the use of social media to connect people and their ideas. Open Collaboration allows the achievement of specific outputs.
- **Stage 4 – Realizing Ubiquitous Engagement**: Allows the engagement of citizens and the public in terms of "co-designing", "co-commissioning", "co-delivering", and "co-assessing". This also includes the joint performance of tasks down to task delegation and voluntary activities.

The stages follow a logical order, and therefore should not all be implemented at the same time. The individual stages provide the foundation for the respective next stage. Limited resources are another reason why an incremental approach is appropriate.

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4 Lee; Kwak: Open Government Implementation Model, 2011
1 Stage 1 – Increasing Data Transparency

The central focus in the first stage is on increasing data transparency in order to enable participation processes in the first place. Deployment of social media is not yet absolutely necessary at this stage; the use of already existing web portals is adequate.

Stage 1 focuses mainly on two challenges:

- Identifying potentially high-value or high-impact data.
- Improving an assuring data quality: accuracy, consistency and timeliness

Both challenges are best tackled with the help of internal data monitoring as a central measure.

Figure 4: Measures in Stage 1


1.1 Preparation: Institution of an Open Government Competence Centre

In order to implement Open Government, it is first necessary to determine responsibilities. Given limited public sector resources, it is not recommended to create new departments. Moreover, an interdisciplinary approach is required. It is therefore recommended to establish a "virtual organisational unit": the Open Government Competence Centre.

For very small administrative agencies, the Competence Centre can also be run by a small number of people. For large organisations, it is essential to ensure a balanced composition. In particular, persons from e. g. the following organisational units should come into consideration:

- Administrative Management, Top Management
- Administrative Innovation, Administrative Modernisation
- ICT, E-Government, EDP
- Public Relations, Social Media
Legal, Data Protection
Perhaps also data-intensive specialist departments, such as GIS, Environment, Statistics, etc.

Team play between politics and administration
If the OGD initiative is not the result of a political decision or mandate, it is essential to provide the political bodies with timely information on planned events.

The regular exchange of information between politically accountable players (Municipal Councillor, City Councillor, and Mayor) and the OGD Competence Centre throughout the term of the initiative is likewise of the essence. Figure 5 shows an example of the Open Government Structure in the City of Vienna.

Figure 5: Team play between politics and administration in the City of Vienna

![Open Government Structure in the City of Vienna](image)

Source: City of Vienna, MD-OS/IKT, 2012

Functions
Both administrative employees and the public are engaged in the process as quickly and early as possible using a democratic bottom-up approach. The OGD Competence Centre has two essential functions:

- The Competence Centre functions as an **internal governing body** for Open Government. This steering group coordinates OGD activities, such as internal data...
monitoring and offers employees special services, such as training on how to deal with social media or issues relating to data formats, etc.

- The Competence Centre is an external point of contact for Open Government and is available for questions relating to already published datasets and for proposals regarding data to be published in the stage to come. The proposals submitted are evaluated and discussed in the Competence Centre, feedback is provided to the stakeholders according to the principles of equality, fairness, and responsibility.

Measures

The OG Competence Centre carries out e. g. the following operative measures:

- **Pilot projects** extending beyond the pure release of data are initiated in the context of the Competence Centre. Various stakeholders are included in this process.
- **Competitions** are carried out to promote use of the data.
- **Interviews with stakeholders** are conducted.
- **OGD platform meetings with administration or barcamps** are conducted. In these, stakeholder groups are invited to discuss with administration on data to be released and its potential applications.
- **Governance structures for data release are developed**: Internal processes must be defined on how to handle the release of data, which criteria to apply for internal data monitoring and how to apply the Implementation Model during the release of data.
- The Competence Centre provides support for cultural change: The required cultural change in administration cannot be imposed; the process requires slow and careful planning and support. Successful measures can be made known as examples of best practice and the management level must work on making administration opener, more transparent and collaborative. Awards can be granted for new ideas contributed by employees in internal idea contests (suggestion schemes).
- **Training measures**: Offers of educational and further training options (see below)
- The Competence Centre establishes key figures for the measurement of success and monitors their achievement: While, at the beginning, key figures will measure mainly process output, by and by, there should be a shift toward outcome-oriented key figures. Key figures can be e. g.:
  - Public awareness of Open Government initiatives and services
  - Public awareness of the openness of public administration
  - Public satisfaction with interaction with public administration
  - Cultural changes in organisational units of public administration toward more openness
  - Number of published datasets
  - Number of data downloads
  - Number of data portal visitors
  - Percentage of returning visitors
  - Number of communication channels
  - Time visitors spend on the data portal
  - Data accuracy and data consistency
  - Timeliness of the data
  - Frequency of data updates
  - Drop in number of inquiries following release of data
The Competence Centre develops a Community of Practice: Handling open data is new not only for public administration, but also for politics and the public. Therefore it makes sense to organise the sharing of experiences. In Austria, for instance, the "Cooperation OGD Austria" was founded in this vein.

The Competence Centre monitors compliance with OGD principles.

Training measures

Suggested topics for training measures are Open Government basics, legal and technical aspects, the new roles of Open Government Data Manager (central responsibility in an organisation) and Open Government Data Engineer (supervises a special field in terms of content), as well as general issues related to modern administrative management with Open Government.

To achieve wide impact with Open Government, appropriate offers of education and training are required - similar to the School of Data in the UK. Currently, OGD projects are carried out on the basis of best practices and knowledge networks. Today, knowledge of OGD is limited to a small number of places in administration, economy, and science. Relevant educational opportunities should be put in place in order to allow a professional and goal-oriented approach to the topic in the various administrative agencies.

Cooperation OGD Austria is currently considering the institution of an "OGD Academy", because an education of this type is not yet widely available in Austria. To date, only Great Britain has founded a relevant institution.⁵

1.2 Measure: Creating a Data Catalogue

In a first internal process, databases should be identified that are suitable for publication on an Open Government data portal.

In this stage, it is not advisable to publish as many databases as possible, but only the most critical ones. The process should apply the Pareto principle and aspire to identify the top 20% of databases that would most benefit the public.⁶

Addressing the following issues is recommended to get results as quickly as possible:

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⁵ [http://schoolofdata.com](http://schoolofdata.com) [Download: 27 September 2012]

⁶ According to the Pareto principle, 80% of the results come from 20% of the effort. Compare [http://de.wikipedia.org/wiki/Paretoprinzip](http://de.wikipedia.org/wiki/Paretoprinzip) [Download: 27 September 2012]
Figure 6: Creating a Data Catalogue

A - Self-screening: What have we ourselves published so far?

The simplest approach of all is to establish what data the agency itself has published so far. Often documents that do not fulfil the requirements of an Open Data Portal yet will have been published already. The criteria for internal data monitoring (see chapter 1.3) provide information on issues remaining to be addressed. For instance, the minutes of municipal council meetings published in PDF format must be converted into text documents or financial statements converted into CSV format.

B - External screening: What have others published so far?

Since there are already numerous national and international examples of published data, it is worth looking at the OGD portals of other agencies in order to get an impression of the type and volume of data already published there.

The data portals already implemented provide a starting point for this.

- [http://publicdata.eu](http://publicdata.eu) - the European Data Portal or international
- [http://www.datacatalogs.org](http://www.datacatalogs.org) and [http://thedatahub.org](http://thedatahub.org)
- [http://data.gv.at](http://data.gv.at) – the OGD portal in Austria or independent portals as well, such as [http://data.wien.gv.at](http://data.wien.gv.at), [http://data.linz.gv.at](http://data.linz.gv.at), [http://data.graz.gv.at](http://data.graz.gv.at), [http://data.tirol.gv.at](http://data.tirol.gv.at)
- [http://www.daten-deutschland.de](http://www.daten-deutschland.de) or by then [http://de.ckan.net](http://de.ckan.net) for Germany or independent portals as well, such as [http://daten.berlin.de](http://daten.berlin.de) and [http://daten.bremen.de](http://daten.bremen.de)
- [http://data.stadt-zuerich.ch](http://data.stadt-zuerich.ch) in Switzerland
C - Stakeholder screening: What do the stakeholders want?
The following target groups can be distinguished⁷:
- Citizens as players in the private and family spheres
- Business as players on the market
- Policy and administration as players in public government authorities
- Civil society as players in the public sphere

The following players were identified as cross-sectional groups:
- The media as guarantor of the public sphere, both as controllers of the governmental and economic spheres.
- Science as the mainspring of social progress through knowledge production and tertiary education
- Players in the educational system as suppliers to the members of a society

For the third step it is necessary to have the results of the internal and external screenings already available. Surveys and events are opportune methods for becoming familiar with stakeholder interests. Meeting and speaking to policy makers and the relevant specialist departments is recommended to kick off discussions with political and administrative representatives. Possibly, these stakeholders may first need an introduction to the subject of Open Government complete with a discussion of goals, measures and examples. Discourse with politics seeks in particular to identify main points of focus for datasets to be published (defining a focus from a political point of view). From a specialist point of view, aside from defining a focus, discourse with the specialist departments has the function of identifying possible specific datasets as well.

It also helps to refer to already achieved results in the stakeholder screening, e. g.
- Open3.at: "Kategorien von Daten, um die es geht."⁸
- Survey results, e. g. - Vienna [http://data.wien.gv.at/neuigkeiten/wege/umfrageergebnis.html](http://data.wien.gv.at/neuigkeiten/wege/umfrageergebnis.html)
- Open Knowledge Forum: [http://open.semantic-web.at/display/OGDW/Wie+weiter+mit+ODG+-+Umfrageergebnisse](http://open.semantic-web.at/display/OGDW/Wie+weiter+mit+ODG+-+Umfrageergebnisse)
- Identification of suitable available databases⁹

Creating a Data Catalogue
Steps A-C indicate a potential data catalogue. These indications can be very specific down to dataset level (e. g. in Step B) or still rather abstract as a form of setting priorities (e. g. in Step C - "Data from the environmental field").

In order not to unnecessarily delay the first release of data, the first two steps can already deliver enough information to allow release of first data. A step-by-step approach is recommended for the releases: first launch an OGD portal and fill it initially with at least five to ten datasets. The next data releases can be scheduled internally, discussed with the stakeholders and also

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communicated externally. By end of September 2012, the City of Vienna will have reached Stage 7 in terms of data release and plans to reach as high as Stage 12 by the end of 2013.

By the end of the first stages that require less effort to implement, the following procedure is recommended for the creation of a more comprehensive data catalogue:

- **Compilation by specialised departments**: The know-how on the data required or generated for the provision of services, is available in the specialised departments. If a product or services catalogue is available to the administrative agency, it can be used as a reference point. If not, activities would need to follow along the lines of the administrative agency's organisational structure.

- **Perusal of forms**: In addition, it can be useful to peruse the application forms required in a procedure. The data queried there yields very specific pointers on the kind of datasets available.

- **Perusal of IT systems**: In the end, the specific design of datasets is supplied by the data-processing IT systems (databases, applications, business applications, registers) in which data is entered for processing.

In the quest for appropriate data to use in the data catalogue, the following distinguishing features may help to obtain a comprehensive view of the possible data sources:

**Perspectives on data**

- Results & effects (e.g. number of children in kindergartens)
- Structure and processes (e.g. number of kindergarten spaces, enrolments)
- Finances & economic viability (e.g. kindergarten costs)
- Staff/education, innovation (e.g. satisfaction of kindergarten teachers)
- Citizen/customer orientation (e.g. citizen satisfaction with child care)

**Types of data**

- Structural data/geo data (e.g. locations including more information such as opening hours)
- Financial/budget data: estimates/annual financial statements, support funding
- Form data/input data, e.g. data from registrations
- Performance data/output data: Number of registrations, number of administrative decisions
- Measurement and survey data, e.g. from customer or employee surveys
- Content data/statistical data: age, gender, place of residence, citizenship, native language.

Effortless publication will be possible for only a small share of the data. Instead, the actual task will be to evaluate data destined for publication using a set of criteria. Stages A-C for creating a data catalogue primarily support the process of ideation; they cannot guarantee that the release of this data makes sense. Therefore, it is necessary to perform internal data monitoring in order to obtain internal control-relevant information.

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10 Modelled on relevant measurement and control dimensions in public administration, see Biwald: Ganzheitliche Steuerung in der öffentlichen Verwaltung, 2005.
1.3 Measure: Performing Internal Data Monitoring

Internal data monitoring is designed to increase data transparency and identify (additional) internal databases. In a first step, the following internal structural data is useful for the generation of the data catalogue:

- Dataset designation
- Product number and product designation (provided a product and service catalogue is available)
- Provider of the data (organisational unit)
- Primary source of data: Yes/no
- Data-controlling person: Name/contact
- Desired date of publication

The administrative offices/departments evaluate internal data using the following criteria and report datasets to be published as Open Government Data to the Competence Centre. The total score awarded helps determine an order in which to process/publish datasets:

**Table 1: Criteria for Internal Data Monitoring**

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Description</th>
<th>Score (0-5 points)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Non-disclosure/legal restrictions</strong></td>
<td>Is the data subject to non-disclosure obligations or other legal restrictions or does it include data critical for infrastructure?</td>
<td>0: non-disclosure obligation 1: restrictions exist, are hardly alterable (e.g., EU restrictions) 2: restrictions exist, alterable (e.g., regional or district council with extraordinary resolution with 2/3 majority) 3: restrictions exist, easily alterable (e.g., regional or district council with simple majority) 4: restrictions exist, very easily alterable (e.g., internal rules and practices) 5: no restrictions</td>
</tr>
<tr>
<td><strong>Personal or corporate references</strong></td>
<td>Does the data include personal references or can individuals or companies be identified?</td>
<td>0: personal data 1: data cannot be made anonymous, missing approval hardly obtainable 2: data cannot be made anonymous, missing approval obtainable 3: approval obtained (e.g., subsidy data) 4: data can be made anonymous 5: no identification of individuals or companies possible, or no infringement of interests in secrecy deserving protection (sec. 8 Data Protection Act)</td>
</tr>
<tr>
<td><strong>Copyright</strong></td>
<td>Is the administrative agency sole proprietor of data copyright?</td>
<td>0: no copyright: disclosure not possible 1: subject to license fees and approval 2: subject to license fees, approval obtained 3: no license fees, subject to approval 4: no license fees, no approval needed 5: sole possession of copyright ensured</td>
</tr>
<tr>
<td><strong>Value</strong></td>
<td>How high is the estimated value of disclosure for all target groups?</td>
<td>1: very low value 2: low value 3: medium value 4: high value 5: very high value</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Description</th>
<th>Score (0-5 points)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effort</td>
<td>How high is the effort of disclosure?</td>
<td>0: unjustifiable cost</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1: very high cost</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2: high cost</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3: medium cost</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4: low cost</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5: very low</td>
</tr>
<tr>
<td>Content-related data quality</td>
<td>How high is the estimated data quality? (timeliness, completeness, accurateness, faultiness)</td>
<td>0: data quality unjustifiable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1: data quality very low</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2: data quality low</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3: data quality medium</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4: data quality high</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5: data quality very high</td>
</tr>
<tr>
<td>Technical availability</td>
<td>Available data formats and data sources, open standards: OGD formats, extended Five-Star System (see Table 4 and Table 5)</td>
<td>1: data available electronically</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2: data available in machine-readable format</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3: data available in OGD formats</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4: data available with URI / as RDF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5: data available as Linked Data</td>
</tr>
<tr>
<td>Synergy</td>
<td>Are agencies already making the data/services available for other purposes?</td>
<td>1: already voluntarily published</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2: soon to be published voluntarily</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3: to be published under alterable regional/national laws</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4: already published (e. g. INSPIRE, Environmental Information Directive 2003/4/EC…) under an obligation (e. g. statutory, EU or contractual requirements)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5: to be published (e. g. INSPIRE, Environmental Information Directive 2003/4/EG…) under an obligation that is hard to change (e. g. statutory, EU or contractual requirements)</td>
</tr>
</tbody>
</table>


Evaluation of individual criteria with 0 (marked red) indicates that their disclosure is currently not feasible. Criteria for which 0 was not awarded may not score any points either, but this is not considered a reason for excluding disclosure. If the decision is made not to disclose data due to a low score, measures must be taken to improve the quality of the data. The data can be re-evaluated once this is accomplished.

A lack of any weighting of the criteria implies that each criterion is of equal importance. This is a simplifying assumption, which is however, sufficient for internal data monitoring. A dataset is assessed and the results of this assessment help to identify further datasets suitable for (priority) disclosure. However, it would be just as easily possible to assign individual weights to the criteria according to preference. In this case, we recommend using standard weight 2 and to grade down to 1 or up to 3, as required. The number of points is multiplied by the weight to produce a score rating.
### Table 2: Internal Data Monitoring with weighting

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Score (0-5 points)</th>
<th>x Weight</th>
<th>= Score</th>
</tr>
</thead>
</table>
| **Non-disclosure/legal restrictions**  | 0: non-disclosure obligation  
1: restrictions exist, are hardly alterable  
2: restrictions exist, alterable  
3: restrictions exist, easily alterable  
4: restrictions exist, very easily alterable  
5: no restrictions                      | 1 - lower  
2 - lower  
3 - normal  
4 - lower  
5 - higher                                   |                         |         |
| **Personal or corporate references**   | 0: personal data  
1: data cannot be made anonymous, missing approval hardly obtainable  
2: data cannot be made anonymous, missing approval obtainable  
3: disclosure approval obtained  
4: data can be made anonymous  
5: no identification of individuals or companies possible, or no infringement of interests in secrecy deserving protection (sec. 8 Data Protection Act) | 1 - lower  
2 - lower  
3 - normal  
4 - lower  
5 - higher                                   |                         |         |
| **Copyright**                          | 0: no copyright: disclosure not possible  
1: subject to license fees and approval  
2: subject to license fees, approval obtained  
3: no license fees, subject to approval  
4: no license fees, no approval needed  
5: sole possession of copyright ensured | 1 - lower  
2 - lower  
3 - normal  
4 - lower  
5 - higher                                   |                         |         |
| **Value**                              | 0: very low value  
1: low value  
2: medium value  
3: high value  
4: very high value                           | 1 - lower  
2 - lower  
3 - normal  
4 - lower  
5 - higher                                   |                         |         |
| **Effort**                             | 0: unjustifiable cost  
1: very high cost  
2: high cost  
3: medium cost  
4: low cost  
5: very low                                   | 1 - lower  
2 - lower  
3 - normal  
4 - lower  
5 - higher                                   |                         |         |
| **Content-related data quality**       | 0: data quality unjustifiable  
1: data quality very low  
2: data quality low  
3: data quality medium  
4: data quality high  
5: data quality very high                    | 1 - lower  
2 - lower  
3 - normal  
4 - lower  
5 - higher                                   |                         |         |
| **Technical availability**             | 1: data available electronically  
2: data available in machine-readable format  
3: data available in OGD formats  
4: data available with URI / as RDF  
5: data available as Linked Data            | 1 - lower  
2 - lower  
3 - normal  
4 - lower  
5 - higher                                   |                         |         |
| **Synergy**                            | 1: already voluntarily published  
2: soon to be published voluntarily  
3: to be published under alterable regional/national laws  
4: already published under an obligation  
5: to be published due to a hardly alterable obligation | 1 – lower  
2 - lower  
3 - normal  
4 - lower  
5 - higher                                   |                         |         |


---

1.4 Measure: Improving Data Quality

Ten principles of Open Government Data

As early as by the end of 2007, Open Government advocates formulated eight principles of Open Government Data in the USA, which were subsequently expanded to ten by the Sunlight Foundation. The KDZ Centre for Public Administration Research and the City of Vienna adapted these principles to reflect Austrian conditions.

When open data is disclosed, the following OGD principles should be complied with. If compliance with individual principles is not possible, justification should be provided and submitted to the OGD Competence Centre to authorise the derogation.

Table 3: Ten principles of Open Government Data

<table>
<thead>
<tr>
<th>Principle</th>
<th>Description</th>
<th>Compliance (yes or justification)</th>
</tr>
</thead>
</table>
| 1. Completeness and Data Protection | Datasets released by the government should be as complete as possible, reflecting the entirety of what is recorded about a particular subject. Metadata that defines and explains the raw data should be included as well, along with formulas and explanations for how derived data was calculated. Doing so will permit users to understand the scope of information available and examine each data item at the greatest possible level of detail.  
  **Personal data is generally exempt from disclosure.** If there is a risk of individuals being identifiable through the information disclosed, this should be reported to the OGD Steering Committee whose task it will be to make a decision on disclosure.  |                                                                                  |
| 2. Primacy                       | Datasets collected and released by the government should be primary source data. This should be done at the highest possible level of detail, not in aggregate or otherwise modified formats.                                                                                                                                                                                                                                                                                                                                                     |                                                                                  |
| 3. Timeliness                    | Datasets released by the government should be available to the public in a timely fashion. Whenever feasible, information collected by the government should be released as quickly as it is gathered and collected. Real-time information is published using an application programming interface (API).                                                                                                                                                                                                                                                  |                                                                                  |
| 4. Ease of Physical and Electronic Access | Datasets released by the government should be as accessible as possible and barrier-free. Barriers to physical access (e.g., requirements to visit a particular office in person or requirements to comply with particular procedures and technical barriers (e.g., access to data only via submitted forms or systems that require browser-oriented technologies (e.g., Flash, Javascript, cookies or Java applets) should be avoided.                                                                                                                                                                                                 |                                                                                  |

---

<table>
<thead>
<tr>
<th>Principle</th>
<th>Description</th>
<th>Compliance (yes or justification)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Machine Readability</td>
<td>Data should be stored in widely used file formats that easily lend themselves to machine processing in order to allow automatic structured processing. The use of several different file formats is recommended. When other factors necessitate the use of difficult-to-parse formats, data should also be available in machine-friendly formats. These files should be accompanied by documentation related to the format and how to use it in relation to the data.</td>
<td></td>
</tr>
<tr>
<td>6. Non-Discrimination</td>
<td>Any person can access the data at any time without having to identify him/herself or provide any justification for doing so. Note: This does not subsume &quot;barrier-free accessibility&quot;.</td>
<td></td>
</tr>
<tr>
<td>7. Use of Commonly Owned Standards</td>
<td>Where possible, the formats in which administrative agencies publish data should be open standards over which no legal person has unique control (see &quot;OGD formats&quot;). Administrative agencies are guided in their choices by standards developed by the World Wide Web Consortium (W3C) or by the practices of platform digital Austria or the recommendations of SAGA[^14] in Germany.</td>
<td></td>
</tr>
<tr>
<td>8. Licensing</td>
<td>Administrative agencies disclose public administrative data under the licence: Creative Commons Attribution 3.0 Austria (CC BY 3.0).</td>
<td></td>
</tr>
<tr>
<td>9. Permanence</td>
<td>Information released by the government online should be documented comprehensively with metadata and should be available online for a long period of time. Information made available online should remain online, with appropriate version-tracking and archiving over time.</td>
<td></td>
</tr>
<tr>
<td>10. Usage Costs</td>
<td>As a result of the established use of the licence &quot;Creative Commons Attribution 3.0 Austria&quot; (CC BY 3.0), the imposition of access fees is not planned.</td>
<td></td>
</tr>
</tbody>
</table>


**OGD Formats**

In principle, OGD formats should be open formats, i.e. published specifications should exist and the formats should be available for use without legal restrictions. Usually, the development of open formats is under the control of a non-proprietary body. The following tables provide an (incomplete) overview of typical open formats that are suitable for OGD[^15].

**Table 4: OGD formats**

<table>
<thead>
<tr>
<th>Text and table formats</th>
<th>Ending</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classic text file</td>
<td>txt</td>
</tr>
<tr>
<td>Comma Separated Value</td>
<td>csv</td>
</tr>
</tbody>
</table>


[^15]: Lucke; Geiger: Open Government Data, 2010, extended by formats of the City of Vienna.
**Text and table formats**  

<table>
<thead>
<tr>
<th>Text and table formats</th>
<th>Ending</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertext Markup Language for unstructured texts(^{16})</td>
<td>html</td>
</tr>
<tr>
<td>Extensible Markup Language</td>
<td>xml</td>
</tr>
<tr>
<td>Resource Description Framework</td>
<td>rdf</td>
</tr>
<tr>
<td>Open Document Formats</td>
<td>odt, ods,….</td>
</tr>
<tr>
<td>Newsfeed/Webfeed Syndication</td>
<td>rss, atom</td>
</tr>
<tr>
<td>JSON (JavaScript Object Notation)</td>
<td>json</td>
</tr>
</tbody>
</table>

**Image formats**  

<table>
<thead>
<tr>
<th>Image formats</th>
<th>Ending</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portable Network Graphics</td>
<td>png</td>
</tr>
<tr>
<td>JPEG</td>
<td>jpg, jpeg, jp2</td>
</tr>
<tr>
<td>Scalable Vector Graphics</td>
<td>svg</td>
</tr>
</tbody>
</table>

**Geodata formats**  

<table>
<thead>
<tr>
<th>Geodata formats</th>
<th>Ending</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geography Markup Language</td>
<td>gml</td>
</tr>
<tr>
<td>GPS Exchange Format</td>
<td>gpx</td>
</tr>
<tr>
<td>Keyhole Markup Language</td>
<td>kml</td>
</tr>
<tr>
<td>ESRI Shapefile</td>
<td>shp, shx, dbf, prj</td>
</tr>
<tr>
<td>GeoRSS</td>
<td>rss, atom</td>
</tr>
</tbody>
</table>

**Interfaces and services**  

<table>
<thead>
<tr>
<th>Interfaces and services</th>
<th>Ending</th>
</tr>
</thead>
<tbody>
<tr>
<td>Web Map Service (WMS)</td>
<td>wms</td>
</tr>
<tr>
<td>Web Feature Service (WFS)</td>
<td>wfs</td>
</tr>
<tr>
<td>Web Map Tile Service (WMTS)</td>
<td>wmts</td>
</tr>
<tr>
<td>Web Catalogue Service (WCAS) or Catalog Service for the Web (CSW)</td>
<td>wcas, cswh</td>
</tr>
</tbody>
</table>


**Extended Five-Star System**

The founder of the WWW and director of the W3C Consortium, Tim Berners Lee, developed a model for Open Government Data known as the Five-Star System, which aims to provide a Linked Government Data Infrastructure on the basis of open W3C standards called Linked Open Data.\(^{17}\) In amendment of the model, a sixth star is sometimes mentioned for the description of data with metadata\(^{18}\); however, this can also be done before the fourth star is reached, therefore we follow the Data Market Blog recommendation to extend the model by a 3.5 stars rating:\(^{19}\)

---

\(^{16}\) HTML documents comply with OGD principles if HTML is used for logical data structuring. HTML pages that mix visual processing and logical structuring usually do not comply with OGD requirements. Reference to existing websites that contain visual and unstructured information are not considered valid OGD documents.


\(^{18}\) see e.g. Voss; Schönert: Open Government Data für Kommunen, 2012.

\(^{19}\) Berners-Lee proposed a five-star system in an inauguration talk to the Gov 2.0 Expo in Washington; see: [http://inkdroid.org/journal/2010/06/04/the-5-stars-of-open-linked-data](http://inkdroid.org/journal/2010/06/04/the-5-stars-of-open-linked-data) [Download: 27 September 2012] An extension by a 3.5 star rating was proposed in the Data Market Blog (Gislason, 2012) see [http://blog.datamarket.com/2012/05/25/tim-berners-lees-missing-star-2/](http://blog.datamarket.com/2012/05/25/tim-berners-lees-missing-star-2/) [Download: 27 September 2012].
Table 5: Extended Five-Star System

<table>
<thead>
<tr>
<th>Star</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1 star: Data on the web, open licence (no matter the format)</td>
</tr>
<tr>
<td>2</td>
<td>2 stars: Data in structured format (e.g. Excel)</td>
</tr>
<tr>
<td>3</td>
<td>3 stars: Data in structured, open format (e.g. CSV instead of Excel)</td>
</tr>
<tr>
<td>3.5</td>
<td>3.5 stars: consistent formats, documented metadata, machine-readable indexes</td>
</tr>
<tr>
<td>4</td>
<td>4 stars: Use of unique URLs to link datasets</td>
</tr>
<tr>
<td>5</td>
<td>5 stars: Linked own data with other data</td>
</tr>
</tbody>
</table>


Data standards

Ultimately, high-quality statistics can only be based on adequate methodology. This requires the use of suitable instruments and procedures as well as an appropriate stringent definition of logics. It is necessary to use appropriate norms and standards in the datasets as early as when the raw data is released.

Table 6: Data Standards

<table>
<thead>
<tr>
<th>Guideline</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Naming the datasets</td>
<td>For best orientation, it is recommended to take the cue from the latest scientific evidence, international norms and standards, guidelines and best-practice solutions. When naming the datasets, attention should be paid to ensuring territorial (local) uniqueness (according to IATA: VIE, SZG) and linking it to thematic priorities (no more than three subject areas). See</td>
</tr>
<tr>
<td>2. Columns in CSV tables</td>
<td>The columns of the CSV table should be standardised to the effect that - where possible - a three-digit letter combination is derived from the relevant English technical terms (age group =&gt; age_grp; population men =&gt; pop_men etc.). See: Citizenship, country of birth or migration background should comply with the &quot;ISO 3166-1 alpha-3-code&quot; standard (e.g. POP_DEU). See: <a href="http://www.praefix.com/iso3.php">http://www.praefix.com/iso3.php</a></td>
</tr>
<tr>
<td>3. Territorial allocation</td>
<td>Here too, a standardised, internationally coordinated procedure applies (e.g. NUTS2, NUTS3, LAU1, LAU2). [20] Territorial ID labelling is based on the official arrangements made internationally that can be used directly for geographic information systems or for import into databases. Some categories still lack agreed arrangements and are e.g. subject to an active evaluation process and indirect quality assurance with external developers. Ultimately, subject categories should be coordinated according to content (age groups in 5-year increments, wide age groups). The levels of structuring territorial allocation and attributes should be established and taken into account for all datasets, e.g.: Package 1: Country – Age – Gender Package 2: District – Gender Package 3: Registration district – Gender Package 4: Forecast Area – Gender</td>
</tr>
</tbody>
</table>

Source: City of Vienna, 2012.

---

1.5 Measure: Creating a Stage Plan

It is recommended to plan quarterly stages for data publication and to announce the dates for the latest possible notification and delivery of new datasets.

Notification of the OGD Competence Centre with regard to a new dataset should be provided by the closing date: approx. one month prior to publication.

All relevant data incl. the metadata and a description as prose information for marketing on a website should be provided to the web editorial team by the editorial deadline; recommendation: approx. two weeks prior to publication.

Table 7: Model of a Stage Plan

<table>
<thead>
<tr>
<th></th>
<th>Stage 1</th>
<th>Stage 2</th>
<th>Stage 3</th>
<th>Stage 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Closing date for</td>
<td>1 March 2013</td>
<td>31 May 2013</td>
<td>2 September</td>
<td>15 November</td>
</tr>
<tr>
<td>submissions</td>
<td></td>
<td></td>
<td>2013</td>
<td>2013</td>
</tr>
<tr>
<td>Editorial deadline</td>
<td>15 March 2013</td>
<td>14 June 2013</td>
<td>13 September</td>
<td>29 November</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2013</td>
<td>2013</td>
</tr>
<tr>
<td>Publication</td>
<td>29 March 2013</td>
<td>28 June 2013</td>
<td>27 September</td>
<td>13 December</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2013</td>
<td>2013</td>
</tr>
</tbody>
</table>

Source: City of Vienna, 2012.

Figure 7: Example of a data catalogue incl. evaluation and stage planning

Source: City of Vienna, 2012.
1.6 Measure: Collecting metadata

It is essential to take specialist metadata and the Metadata Convention for Open Government Data Portals into account at as early a time as possible.

Metadata standards


The use of a specific metadata core and extended elements is recommended for the harmonisation of metadata on the Austrian level in compliance with the standards derived from the area of geodata in the INSPIRE Directive (ISO19115\(^21\)) and the Austrian norm ONA2270 \(^22\).

As a result of the INSPIRE Directive (2007/2/EC) of the European Parliament and of the Council of 14 March 2007, administrative agencies have the obligation to progressively provide interoperability for their already available spatial datasets and services. In particular, the current implementation of the INSPIRE Directive provides multiple benefits, e. g. in the future, geodata servers can be used for both INSPIRE and for OGD.

International standards, such as GeoSciML or the INSPIRE data specification should be taken into account and a shared terminological concept should be developed. This "(meta)data harmonisation" has taken the white paper of platform digital Austria into account provided by Cooperation OGD Österreich. \(^23\)

In analogy to the maturity of the extended Five-Star System, the ISA proposes a Maturity Model for metadata management\(^24\).

**Table 8: Maturity Model for Metadata Management**

<table>
<thead>
<tr>
<th>Maturity Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 1 – ignored metadata</td>
<td>There is no metadata available.</td>
</tr>
<tr>
<td>Stage 2 – scattered/locked metadata</td>
<td>Some metadata has been described, but it cannot be accessed in a structured place or freely used.</td>
</tr>
<tr>
<td>Stage 3 – open metadata for people</td>
<td>Metadata is documented and usable, but not in reusable formats, e. g. PDF files</td>
</tr>
<tr>
<td>Stage 4 – open, reusable metadata</td>
<td>Metadata is administered centrally and made available as open metadata in machine-readable formats and/or via an API.</td>
</tr>
<tr>
<td>Stage 5 – linked open metadata</td>
<td>Linked metadata is used (see <a href="https://joinup.ec.europa.eu/asset/page/practice_aids/linked-metadata">https://joinup.ec.europa.eu/asset/page/practice_aids/linked-metadata</a> and administered with a metadata management system.</td>
</tr>
</tbody>
</table>


\(^22\) [http://www.ageo.at/aktuelles/oenorm-A2270](http://www.ageo.at/aktuelles/oenorm-A2270) [Download: 27 September 2012]


The highest possible level of maturity should be aspired to in metadata management (see table 6).

1.7 Measure: Creating an Open Government Data Portal

Data portals are relevant on multiple levels:

Own Open Government Data Portal – data.ORGANISATION.gv.at

The Open Government Data Portal is the central point of contact for open data. The metadata on the published datasets can be made available in other data portals as well; and, depending on the agency's size, the actual data can be managed in the agency's own data portal.

There are the following possibilities for creating data portals (depending on the organisation's size and capabilities):

- **Complete separate data portal.** In this case, the recommendation is to deploy the internationally used open source solution CKAN\(^ {25} \) recommended by Cooperation OGD Österreich on an own server. CKAN can be used both to create an own metadata catalogue and for data management. So far, Graz and Linz have elected to follow this route, and data.gv.at is also based, among other things, on CKAN. The City of Vienna has implemented an own portal with the available CMS and is planning the use of CKAN.

- **Shared data portal.** In the future, there will probably be providers of data portal solutions. These providers may be private companies or providers in the public sphere, such as community-based computer centres, administrative cooperation initiatives, etc. As of autumn 2012, using a cloud solution, the Austrian Federal Computing Centre (Bundesrechenzentrum) will grant Austrian administrative agencies use of data.gv.at, including their own data presence (= customisable subpages of data.gv.at).

- **Data portal on own website, separate metadata catalogue.** Smaller organisations, in particular, can provide data for download on their own websites (e. g. CSV files). The data can be fed into the Austrian data portal, which, in order to enable access to the data, refers to URLs of the individual datasets on the organisation's own website. Alternatively, the data can also be saved on data.gv.at and made accessible on the organisation's own data presence (= customisable subpages by data.gv.at). The absence of a suitable data portal solution should be considered a temporary solution. In most cases, the organisations' own websites will not comply with requirements of modern data portals (see below "Features of a data portal").

Austrian data portal – data.gv.at

The Austrian federal portal is the interface to the European Data Portal, contains the metadata of all Austrian Open Government Portals and also offers data management (metadata + data) for regional or local authorities who do not operate their own OGD portals. platform digital Austria has created a white paper describing the framework conditions for Open Government Data Platforms:

In any event, the data of Austrian administrative agencies should also be entered into the Austrian data portal. A client for manual processing and interfaces for automatic synchronisation of metadata are being created for this purpose. Related information cannot yet be found on data.gv.at. Therefore, if needed, the best way to get information now is to contact the Federal Chancellery at data@bka.gv.at until data.gv.at provides the capabilities required for the independent entry of data and metadata.

**European Data Portal - publicdata.eu**

There is a data catalogue on the European level (www.publicdata.eu), in which the open data of national administrative agencies and the European administrative agencies are entered. Other data portals are e.g. [http://www.datacatalogs.org](http://www.datacatalogs.org) and [http://thedatahub.org](http://thedatahub.org).

**Features of a data portal**

A CSC study lists the following criteria for user orientation on data portals: FAQs, help pages, metadata, user feedback for the data, integration of social media offers, RSS, forum, apps (users can upload their own apps to the platform). Features of an Open Government Data Portal include the following: retrievability, standard interfaces, cross-source standard formats, linkability and widgets.

1.8 Further measures

**Integration into standard processes**

By the time the first data is published, arrangements should be made for the update of the data catalogue, the assessment of the datasets, and the publication process in the administration's standard processes.

- **IT Systems**: IT systems (e.g. business applications) can be expanded so as to allow the automatic or semi-automatic publication of data in order to reduce the manual effort of publication.
- **Projects**: New projects should take data management considerations into due account right from the start. (What data does the project involve?)
- **Processes**: Aside from processes for the publication of data, processes for feedback on datasets should also be implemented (complaint or concern management).

**Evaluation and further development**

In order to ensure the sustainability of the Open Government Data Initiative, it is necessary to develop indicators for measuring the initiative's success and to continuously monitor them.

The web index (which currently does not include Austria), also contains questions on Open Government Data that can likewise be regarded as reference for the future development of the data available:

- **Q22** Government use of open licenses

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28 [http://thewebindex.org](http://thewebindex.org) [Download: 21 September 2012]
Further steps can be found in the following stages of the Implementation Model. Stage 1 does not achieve completion merely by publishing an OGD portal; therefore the Implementation Model should be considered a loop model. Stage 1 is improved on and optimised regularly during and after the other stages.

1.9 Implementation Plan Stage 1

The following implementation plan contains examples of measures along with proposals for their implementation.

Table 9: Action plan

<table>
<thead>
<tr>
<th>Subject</th>
<th>Description</th>
<th>Who</th>
<th>When</th>
</tr>
</thead>
<tbody>
<tr>
<td>OG Competence Centre</td>
<td>establishment of the Competence Centre, internal and external communication</td>
<td>administrative management</td>
<td>at inception, continuously</td>
</tr>
<tr>
<td>generate data catalogue</td>
<td>identify possible datasets</td>
<td>OG Competence Centres</td>
<td>at inception</td>
</tr>
<tr>
<td>data monitoring</td>
<td>internal data monitoring in the administrative offices according to the criteria mentioned, report to OG Competence Centre</td>
<td>all</td>
<td>at inception, continuously</td>
</tr>
<tr>
<td>stage planning</td>
<td>stages of data release</td>
<td>OG Competence Centres</td>
<td>continuously</td>
</tr>
<tr>
<td>employee training</td>
<td>initiating and planning continued training measures</td>
<td>OG Competence Centres</td>
<td>at inception</td>
</tr>
<tr>
<td>publication OGD portal</td>
<td>release of first datasets, announcement of information and communication channels</td>
<td>OG Competence Centres</td>
<td>after approx. 3 months</td>
</tr>
<tr>
<td>continuous communication</td>
<td>continuous communication with stakeholders to improve quality</td>
<td>OG Competence Centres</td>
<td>continuously</td>
</tr>
<tr>
<td>continuous improvement</td>
<td>continuous improvements and error recovery after feedback on datasets</td>
<td>OG Competence Centres</td>
<td>continuously</td>
</tr>
<tr>
<td>Subject</td>
<td>Description</td>
<td>Who</td>
<td>When</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>--------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>OGD platform meetings</td>
<td>organisation of meetings with stakeholders and discussion on datasets and application possibilities</td>
<td>OG Competence Centres</td>
<td>continuously</td>
</tr>
<tr>
<td>OGD survey</td>
<td>online survey of stakeholders</td>
<td>OG Competence Centres</td>
<td>at inception or after approx. 6 months</td>
</tr>
<tr>
<td>OGD Competition</td>
<td>Competition on the use of the data</td>
<td>OG Competence Centres</td>
<td>after approx. 6 months</td>
</tr>
<tr>
<td>publication of other datasets</td>
<td>publication of further datasets and formats</td>
<td>OG Competence Centres</td>
<td>after approx. 6 months, and approx. quarterly</td>
</tr>
<tr>
<td>review of OGD measures</td>
<td>internal event on the evaluation of previous measures and further planning possibly external evaluation of previous measures as well</td>
<td>OG Competence Centres</td>
<td>after approx. 12 months</td>
</tr>
</tbody>
</table>


1.10 Additional information: IT support in Stage 1

Although, as mentioned, software solutions are available for the operation of OGD portals in Stage 1, there are currently no customised support tools available for the stage prior to the publication of data (preparatory phase). The current projects were carried out deploying the following components for internal use:

- **Table calculation programmes**, (e. g. Microsoft Excel or LibreOffice Calc) that can be used to assemble the data catalogue as well as to perform internal data monitoring. Related examples can be downloaded at [http://www.kdz.or.at/de/open-government-vorgehensmodell](http://www.kdz.or.at/de/open-government-vorgehensmodell).

- **Content Management Systems**, (e. g. Drupal or Wordpress) that are often used by administrative agencies to design their administrative homepages.

Internal processes are not ideally supported by either approach. Table calculation programmes allow only limited joint processing or collection of text information. Moreover, it is easy to lose track in large data catalogues. Often, content management systems are not designed for internal processing.

Hence, implementation of a semantic wiki for the preparatory stage provides a solution to the problem (see Figure 8).
Figure 8: Software support for Stage 1


Work on the measures 1.2 - 1.5 are best supported in a semantic Wiki. When generating the metadata (1.6), the question is whether it can be prepared internally prior to (wiki) or only following a decision regarding its release (CKAN). A proof of concept could successfully demonstrate how the Open Source Solution Semantic MediaWiki\(^{29}\) can be used as an OGD cockpit in order to support the entire data management process in administration.

Functionalities of an OGD Cockpit

- **Input form for datasets including:**
  - Internal basic data such as e. g. name of dataset, data-supplying source, primary source of data (yes/no), data controller, desired publication date, link to dataset in data portal
  - Evaluation option according to internal data monitoring criteria
  - Metadata according to Austrian metadata standard

- **Dynamic data catalogue**, which is automatically expanded, as soon as new datasets are entered using the entry form. The entry and administration of data in the wiki ensures collaborative generation and maintenance of the data catalogue.

- **OGD Cockpit** which offers an overview of the data catalogue using a facetted search interface, including filters that can be switched on or off as needed, in order to keep track of the data catalogue.

- **Export options** (e. g. CSV export) in order to enable export of the current data catalogue status anytime and allow their further processing in other applications.

\(^{29}\) [http://www.semantic-mediawiki.org](http://www.semantic-mediawiki.org) [Download: 21 September 2012]
2 Stage 2 – Improving open participation

Stage 2 measures include:
- Increasing media competence
- Developing a social media strategy
- Informative and consultative participation projects

Figure 9: Stage 2 measures


2.1 Measure: Increasing Media Competence

The fast-paced development of our society creates a need for improving media literacy among all parties involved. Public administrators and politicians in particular must learn how to deal with released data, understand its further usage and interpretations, and learn about participation and collaboration.

Removing Barriers to Social Media Access

Firstly, it is essential to remove blocks to social media access. There can be no genuine Open Government strategy if an agency’s own employees are barred from reception of measures in social media. There are many more reasons not to block employees from using social media:
- Blocking social media expresses a lack of confidence in one’s own employees.
- Blocking measures are technically ineffective. There are technical possibilities to circumvent blocks. (e.g., http://proxy.org).
- Blocking workstations does not block access via (private) smartphones.
- Blocking access at the workplace does not prevent usage for business purposes with private equipment outside the premises/working hours.
- Bandwidth or security problems are not technically justifiable.
If employees use social media during working hours out of boredom, there is an organisational problem. Despite access blocks, employees can still fritter away time in different ways, e.g. with (online) newspapers, online shopping, online games, etc.

Social media can be employed in a productive manner (Knowledge Management 2.0); blocks make productive use more difficult.

Social Media Guidelines
As a result, it is essential to develop social media guidelines to create the general conditions needed for using social media and to offer support to the employees. Previously published guidelines can serve as an example for own guidelines:

- Position paper on e-democracy and e-participation in Austria: edem 1.0.0/19 April 2008
- Social Media Guidelines of the City of Vienna: http://www.wien.gv.at/medien/pid/inland/socialmedia/

In addition, Schulz describes measures for creating social media guidelines.

Provide Training
Training should be provided to the employees to improve general media literacy. Training topics could include

- Modern administration management - new control models in administration
- Social Media, Knowledge Management 2.0
- Open Government, Public Governance
- Open Government Data, Linked Data
- Data journalism, data visualisation, data interpretations

2.2 Measure: Creating and Implementing Social Media Strategy

Aside from qualifying employees to deal with social media, it is also necessary to adopt a social media strategy. Due to the varying features, functions, target groups, penetration rates, and possible uses of social networks, this strategy should distinguish between the individual types of social media.

A KDZ publication scheduled for December 2012 will include practical examples as well as further information.

The Implementation Model used by the Free and Hanseatic City of Hamburg can serve a guideline.

2.3 Measure: Informative and consultative public involvement

Participation is nothing new; but the technical possibilities and the dynamism of social networks require radically new approaches. Subdivision into informative, consultative, and cooperative public participation derives from the Standards of Public Participation in Austria.  

Figure 11: Informative, consultative, cooperative participation projects


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The following documents provide additional information:

- **Standards of Public Participation** in Austria (2008; adopted by the Council of Ministers on 2 July 2008, practical guide 2011)
- **Rathaus 2.0**. Practical guide for administration and politics for dealing with online citizen participation by neu & kühn
- **Leitfaden zur Online-Konsultation** (Guidelines for Online Consultation) of the Bertelsmann Foundation
- **ISPRAT study** "E-Partizipation 2.0. Handlungsempfehlungen für Meinungsbildung im Web 2.0"
- **OECD information** on "Public Engagement" at http://www.oecd.org/gov/publicengagement
- The City of Vienna is developing a practice manual entitled "**Praxisbuch Partizipation**" (as yet unpublished)

The guidelines for online consultation (Leitfaden zur Online-Konsultation) published by the Bertelsmann Foundation contains a stage model and illustrates the individual steps for preparation, implementation, and evaluation and points out some of the central questions that arise during a participation process.

**Figure 12: Leitfaden Online-Konsultation**

<table>
<thead>
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<th>Phase I</th>
<th>Klärung der Ziele und Rahmenbedingungen</th>
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<td>Was soll mit der Konsultation konkret erreicht werden?</td>
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<td>Welche Stellen sollen eingebunden werden?</td>
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<tr>
<td></td>
<td>Was ist bei der Festlegung der Zielgruppe zu beachten?</td>
<td>2.3</td>
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<tr>
<td></td>
<td>Welche finanziellen und personellen Ressourcen werden benötigt?</td>
<td>2.4</td>
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<td></td>
<td>Wie findet man den geeigneten Zeitpunkt und Zeiträumen?</td>
<td>2.5</td>
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<table>
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<tr>
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<td>3.1</td>
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<td></td>
<td>Auf welche Weise sollen sich die Teilnehmer einbringen können?</td>
<td>3.2</td>
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<tr>
<td></td>
<td>Welche Instrumente lassen sich für Online-Beteiligung einsetzen?</td>
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<tr>
<td></td>
<td>Wie kann das Verfahren strukturiert werden?</td>
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<tr>
<td></td>
<td>Was ist bei der Umsetzung zu beachten?</td>
<td>3.5</td>
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<tr>
<td></td>
<td>Wie lassen sich Online-Formate durch Offline-Angebote ergänzen?</td>
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<td></td>
<td>Was wirkt im Prozess motivierend – was nicht?</td>
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<tr>
<td></td>
<td>Wie lässt sich die Qualität der Beteiligung fördern?</td>
<td>4.3</td>
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<thead>
<tr>
<th>Phase IV</th>
<th>Auswertung und Abschluss</th>
<th>Kapitel 5</th>
</tr>
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</table>

Source: Koop, 2010

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Participation and Open Government Data
Stakeholders should be provided comprehensive information and consultation as early as during the implementation of an OGD portal. Related examples for this are:

- Carrying out or participating in community meetings for feedback on desired or previously released datasets,
- Carrying out surveys and competitions,
- Publishing the resulting apps and applications on the OGD portal,
- Discussion of data (and the information gleaned from it) and of resulting applications in social networks.

This was mentioned as early as in Stage 1 - during the preparation of the first data releases - and should be continued after publication in order to be able to collect feedback related to the data released and its significance. Furthermore, topics that can be discussed on the basis of released data should become the subject of participation as well. The best known example of this so far are participatory budgets: Beyond the release of budget data in OGD portals, the logical next step would be to allow the public to participate in determining and deciding over how to use parts of the freely usable budgetary means.

In participatory budgets, citizens without a political mandate participate in the management and/or implementation of public finances. According to the research project "European participatory budgets", five additional criteria should be added to this definition in Europe to distinguish participatory budgets from other participatory procedures:

1. Financial aspects, more particularly, the discussion of limited resources, are at the centre of this procedure.
2. Participation takes place on the level of the city as a whole or in a district with its own political administrative capacities (the neighbourhood level alone is not enough).
3. This process should be a long-term one (one event or one referendum on financial questions do not make a participatory budget).
4. The consultation/decision of citizens is based on a discussion process (deliberation) in the context of special meeting/forums. (Opening existing processes of representative democracy for "normal" citizens does not make a participatory budget.)
5. The organisers must be held accountable for the results of the discussion.

Examples

- Comprehensive information on participatory budgets including examples can be found at [http://www.buergerhaushalt-europa.de](http://www.buergerhaushalt-europa.de) and [http://www.buergerhaushalt.de](http://www.buergerhaushalt.de).
- **The most annoying traffic light in Vienna** (August / September 2011)
  Using an online form, citizens can report the most annoying traffic lights in Vienna. More than 3,800 reports were filed during the three-week campaign. The results were documented on a website: . Feasibility of the proposed solutions is tested in cooperation with the responsible districts, Vienna's public transport company (Wiener Linien), Vienna Municipal Department 46, as well as pedestrian representatives, cyclist representatives, and the automobile clubs.

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[35] [http://www.buergerhaushalt-europa.de/ergebnisse.htm](http://www.buergerhaushalt-europa.de/ergebnisse.htm) [Download: 27 September 2012]
Schwedenplatz
The area of Schwedenplatz-Morzinplatz in Vienna's 1st district is scheduled for redevelopment in the next few years. A mission statement will be created by citizens and experts prior to initiation of a design competition by the City of Vienna.


Figure 13: Participation process Schwedenplatz

Source: [http://schwedenplatz.wien.gv.at](http://schwedenplatz.wien.gv.at) [Download: 27 September 2012]
3 Stage 3 – Enhancing Open Collaboration

In the Open Collaboration stage, we distinguish two types of measures:

- **Collaboration**\(^36\) is the achievement of results and effects in cooperation with groups of persons outside the responsible authority.
- **Collaborative public participation**\(^37\) aims at generating political decisions using collaborative methods and measures.

**Figure 14: Stage 3 measures**


3.1 Measure: Collaboration

In the Open Government context, the very general term collaboration that is often used in various contexts signifies particularly the achievement of results and effects in cooperation with groups of persons outside the responsible authority. Terms often used in this context are "open innovation" and "citizen sourcing" ("crowdsourcing" in the public sector).\(^38\) Noveck explains that this is not only about a deliberative democracy, allowing a general discourse on all political themes (public participation), but rather a "collaborative democracy" that allows work on (partial) problem solutions with civil society experts using collaborative processes in order to achieve better results and decisions.\(^39\)

**Examples**

- **Cooperation OGD Austria**: [http://www.data.gv.at/offene-daten/cooperation-ogd-oesterreich/](http://www.data.gv.at/offene-daten/cooperation-ogd-oesterreich/) (Cooperation of administrative agencies and representatives of the OGD)

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\(^{36}\) Collaboration means working together on a mutual project. Use of the term "Kollaboration" in German is based increasingly on the English understanding of "collaboration" for collaborative approaches in the internet such as collaborative writing or collaborative knowledge management (Wissensmanagement, Web 2.0, etc.). This is also referred to as e-collaboration. See [http://de.wikipedia.org/wiki/Kollaboration_(Begriffsklärung)](http://de.wikipedia.org/wiki/Kollaboration_(Begriffsklärung)) (Download: 27 September 2012).

\(^{37}\) "Public participation signifies the opportunity for all people concerned and/or interested, to represent their interests or raise their concerns in terms of the development of plans, programmes, policies or legal instruments." See [http://www.partizipation.at/fileadmin/media_data/Downloads/Standards_OeB/standards_der_oeffentlichkeitsbeteiligung_2008_druck.pdf](http://www.partizipation.at/fileadmin/media_data/Downloads/Standards_OeB/standards_der_oeffentlichkeitsbeteiligung_2008_druck.pdf), p. 23.


Community with the aim of establishing guidelines and standards for Open Government Data.

- **Open Government Partnership**: Voluntary, international, multi-stakeholder initiative with the goal to ensure specific government commitments to citizens in order to increase transparency, empower and engage citizens, fight corruption, and implement new technologies in order to strengthen governance. Unfortunately, so far, no German-speaking country has yet become a member of the Open Government Partnership.

- **Bürger-Solarkraftwerk**: The City of Vienna finances the building of solar power plants through the sale of fixed-interest shares in solar panels.

- **Freiwillig für Wien (volunteers for Vienna)**: The City of Vienna offers a platform for volunteer work in Vienna: [http://www.wien.gv.at/menschen-gesellschaft/freiwillig](http://www.wien.gv.at/menschen-gesellschaft/freiwillig)

- **Maerker Brandenburg**: [http://maerker.brandenburg.de](http://maerker.brandenburg.de) and **Unortkataster Köln** [http://unortkataster.de/](http://unortkataster.de/) allow citizens to report infrastructure problems to the city's administration using mobile terminal devices. There are commercial providers in Austria, such as [http://www.buergermeldungen.com](http://www.buergermeldungen.com) and [http://buergerplattform.at](http://buergerplattform.at).

- **Popular initiative "Transparenz schafft Vertrauen" (Transparence builds confidence)**: [http://www.transparenzgesetz.de/](http://www.transparenzgesetz.de/) Representatives of civil society cooperate to write a legal text on which the municipal government then passes a resolution.

- **GuttenPlag - kollaborative Plagiatsdokumentation**: Documents the plagiarisms in the doctoral thesis and other works of Karl-Theodor zu Guttenberg. Moreover, it serve as an example for the collaborative documentation of plagiarism.

- **Ushahidi**: Non-Profit company specialised on the development of free and open-source software for crowdsourcing, visualisation and interactive mapping. Many more examples are documented on [www.citizensourcing.de](http://www.citizensourcing.de).

**Open Business Data**

Business, in addition to administration, is another significant source of data. To date, this aspect has not been given sufficient attention in the Open Data context. Often companies have data that is interesting for life in a specific area. Related examples for this are:

- mailboxes, post offices (locations, opening and pick-up times)
- bank branches (accessible to people with disabilities), ATM including opening hours
- pharmacies (locations, opening hours, night pharmacies)
- neighbourhood stores (locations, opening hours)
- touristic offers (locations, opening hours, information)
- events
- and much more.

The City of Vienna offers comprehensive information on Vienna with e.g. [wien.at](http://www.wien.at), the city map [http://www.wien.gv.at/stadtplan/](http://www.wien.gv.at/stadtplan/), the Open Government Portal [http://www.wien.gv.at/ikt/opengov](http://www.wien.gv.at/ikt/opengov) and Open Government Data Vienna [http://data.wien.gv.at](http://data.wien.gv.at). Many interesting data sources can be made available to citizens, business and research in an overall view. The City of Vienna also offers the possibility for data sources originating from a Viennese data source.

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40. [http://www.opengovpartnership.org/about](http://www.opengovpartnership.org/about) [Download: 27 September 2012]


42. [http://www.wien.at](http://www.wien.at) [Download: 27 September 2012].


44. [http://www.wien.gv.at/ikt/opengov](http://www.wien.gv.at/ikt/opengov) [Download: 27 September 2012].

45. [http://data.wien.gv.at](http://data.wien.gv.at) [Download: 27 September 2012].
outside of Municipal Departments to be incorporated into the OGD Katalog Wien and the wien.at city map.

A further aspect is that the government can also have a regulating effect on companies. It is thus conceivable to put provisions or incentives in place, requiring companies to publish parts of the data records they collect as Open Data. For instance, data collections using customer cards (supermarkets, retail), are often criticised by data privacy specialists. Rules and regulations applying to the authorisation of the data applications could, e. g., require the publication of certain non-business relevant basic data without any personal references. Mobile phone providers or car repair workshops continuously collect data that could be of interest to society (movement flows of cell phone owners, information from car computers that so far can only be read by repair workshops).

**Quality assurance for apps, applications and visualisations**

After the first stage of Open Data, the first apps, applications and visualisations are created. These are readily advertised on the OGD portals. But in the medium and long-term, the question is how to preserve quality and sustainability.

In a collaborative process, the OGD portal operators could call upon the OGD community to develop quality standards for apps, applications and visualisations and then to apply them by a **voluntary commitment**. For example, self-evaluation through developers with the help of a Gender & Diversibility, Usability and Testing – Check List.46

It is necessary to maintain contacts with developers, in order to ensure the sustainability of the apps and visualisations generated on the basis of OGD. Portal operators are sometimes confronted with user feedback that refers not only to the data, but also to the apps and applications. Such feedback must be passed on to the developers.

A study carried out by Danube University Krems calculated savings in the amount of more than EUR 200,000 if the city had programmed, paid for and sold the apps developed on the basis of the released data itself.47

Sustainability beyond apps, applications and visualizations can only develop if significantly more authorities and significantly more comprehensive datasets are published, so that business models of the economy can build upon them.

### 3.2 Measure: Collaborative Public Participation

Collaborative public participation aims to trigger political decisions regarding collaborative methods and measures. Cooperative public participation48 has existed for some time. In Open Government, the focus is particularly on the application of the new possibilities of web 2.0.

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46 [http://www.zimd.at/g-u][Download: 27 September 2012].
48 “Public participation signifies the opportunity for all people concerned and/or interested, to represent their interests or raise their concerns in terms of the development of plans, programmes, policies or legal instruments.” See [http://www.partizipation.at/fileadmin/media_data/Downloads/Standards_OeB/standards_der_oeffentlichkeitsbeteiligung_2008_druck.pdf][Download: 27 September 2012].
Examples

- **Wiener Charta**: The Wiener Charta (Vienna Charter) develops principles and rules for good coexistence. The citizens of Vienna can determine the topics themselves and actively shape the charter in discussions. Nothing is decreed – the City of Vienna enables this process and provides a setting: [https://charta.wien.gv.at](https://charta.wien.gv.at)

- **Reformdialog für den öffentlichen Dienst (reform dialogue for public service)**: Federal Minister Gabriele Heinisch-Hosek has invited all citizens and public service experts to join in thinking about the future of public service: [http://www.reformdialog.at](http://www.reformdialog.at)

- **For more examples** see [http://www.partizipation.at/praxisbeispiele.html](http://www.partizipation.at/praxisbeispiele.html)

Figure 15: Vienna Charter

![Vienna Charter](https://charta.wien.gv.at)
4 Stage 4 – Realising ubiquitous engagement

Stage 4 measures include:
- Increasing transparency and openness
- Securing long-term multi-channel strategy

Figure 16: Stage 4 measures

The goal is to allow the various stakeholders (in particular citizens) to play a part in the process of policy making and to engage their participation therein. The four-stage model of effective citizen participation by Governance International describes the stages "co-designing", "co-commissioning", "co-delivering", and "co-assessing". Müller's "offene Staatskunst" (open statecraft) likewise seeks to strategically restructure administrative processes in terms of Open Government and also draws on the concept of the four stages of the "Policy Cycle" as an organising framework (agenda setting, policy formation, implementation and evaluation). Openness and transparency can be used as a strategic tool in all stages of the Policy Cycle. The Policy Cycle is illustrated in even greater detail in Figure 17:

49 Bovaird; Löffler; Downe: Public Services, 2009.
50 Internet & Gesellschaft Co:llaboratory: Staatskunst, 2010. For more information on the Policy Cycle see Jann/Wegrich, 2003
51 More related details in Klessmann et. al, 2012
In Stage 4, Open Government aims to achieve the ubiquitous engagement of stakeholders. This is achieved through Transparency (Stage 1), Participation (Stage 2), and Collaboration (Stage 3). Similarly, the Governance Debate of recent years has emphasised this aspect. The reference to the Policy Cycle (see Stage 4) illustrates that the different approaches come together in the Final Phase of Open Government: In particular, the Policy Cycle illustrates where (i.e. in which phases of the policy process) participation should be considered and implemented, while the Open Government Implementation Model shows how (by means of what measures) participation can be achieved, i.e. the multi-stage approach also demonstrates how transparency, participation, and collaboration build upon and are contingent on each other. More details on this will be contained in a KDZ publication scheduled for December 2012.

The Cycle of Transparency reflects a similar system (see Figure 18).
4.1 Measure: Increasing transparency and openness

By Stage 4, it is necessary to take further steps toward increasing transparency and openness that may not have been taken so far. In this context, it is worthwhile to study international examples - also due to cultural differences that have developed historically.

The following topics are examples of the specific themes dealt with in the publication "Opening Government"53:

Source: The Cycle of Transparency by the Sunlight Foundation52.
4.2 Measure: Securing long-term character of multi-channel strategy for ubiquitous engagement

Following the first exciting experiences in terms of steps towards Open Government and administrative action and the pilot projects implemented, the question arises, how to secure ubiquitous engagement in the long-term and in several channels. What is needed here above all, aside from integration into existing administrative processes, are software solutions allowing the rapid launch of new projects. The first such participation platforms already exist on the market. In 2010, Petrik coined the term "Deliberative Collaborative e-Democracy", uniting components of several aspects of democracy and connecting them to the new possibilities available through Web 2.0 and deriving components of an e-Democracy platform therefrom. He outlines the following components of an e-Democracy platform:

- Suggestion system: public database for political suggestions and ideas
- Lobby network: a social network for political purposes
- e-discussion forum: a space for online deliberation
- PolitikWiki: simplifies collaborative work on political contents
- Evaluation system: collaborative online analysis tool for evaluating suggestions
- Decision support system: e-voting component of the e-Democracy Platform

The first practical experience gained by the City of Vienna can serve to define the following elements or requirements of a participation and collaboration platform:

**Functional requirements**

- Several online stages
- Involvement of social media
- Contribution of ideas
- Discussion and moderation
- Evaluations and proposal ranking
Registration and authentication of users at the portal in various ways (user name and password, Facebook, OpenID, mobile phone signature or European standard such as STORK eID,...)

Safe e-voting

Participatory budgeting

Interconnection with GIS systems (e. g. in the case of building developments)

Offline participation

Collaborative development of documents (Wiki)

Commenting documents

**General requirements**

- Open Source Solution
- Accessibility
- Security: e. g. OWASP Guide2

5 OGD Implementation Model - Overall View

Figure 19: OGD Implementation Model: Overall View


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54 [https://www.owasp.org](https://www.owasp.org) [Download: 21 September 2012]
Annex

Abbreviations

API       Application Programming Interface.
CAF       Common Assessment Framework, see http://www.caf-zentrum.at.
CC BY 3.0 AT Creative Commons Attribution 3.0 Austria (CC BY 3.0 AT), see http://creativecommons.org/licenses/by/3.0/at/deed.de.
CKAN      Comprehensive Knowledge Archive Network, see http://ckan.org.
CSV       Comma-separated values, see http://tools.ietf.org/html/rfc4180.
DAMA      Data Management International, see http://www.dama.org.
EFQM      European Foundation for Quality Management, see http://www.efqm.org.
EU/EG     European Union/European Community.
GML       Geography Markup Language, see http://www.opengeospatial.org/standards/gml.
GPX       GPS Exchange Format, see http://www.topografix.com/gpx.asp.
ICT       Information and Communications Technology.
ISO       International Organization for Standardization, see http://www.iso.org.
JPEG      Joint Photographic Experts Group, see http://www.jpeg.org.
KML       Keyhole Markup Language, see http://code.google.com/apis/kml/documentation/kmlreference.html.
LAU       Local Administrative Units, see http://epp.eurostat.ec.europa.eu/portal/page/portal/nuts_nomenclature/local_administrative_units.
OGD       Open Government Data.
PNG       Portable Network Graphics, see http://www.libpng.org/pub/png/.
RDF       Resource Description Framework, see http://www.w3.org/RDF/.
RSS       Really Simple Syndication, see http://www.rssboard.org/rss-specification.
SVG       Scalable Vector Graphics, see http://www.w3.org/TR/SVG/.
URI       Uniform Resource Identifier (URI) is an identifier composed of a sequence of characters that serves to identify an abstract or physical resource.
W3C       World Wide Web Consortium, see http://www.w3.org.
WFS       Web Feature Service, see http://www.opengeospatial.org/standards/wfs.
WMS       Web Map Service, see http://www.opengeospatial.org/standards/wms.
WMTS      Web Map Tile Service, see http://www.opengeospatial.org/standards/wmts.
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