

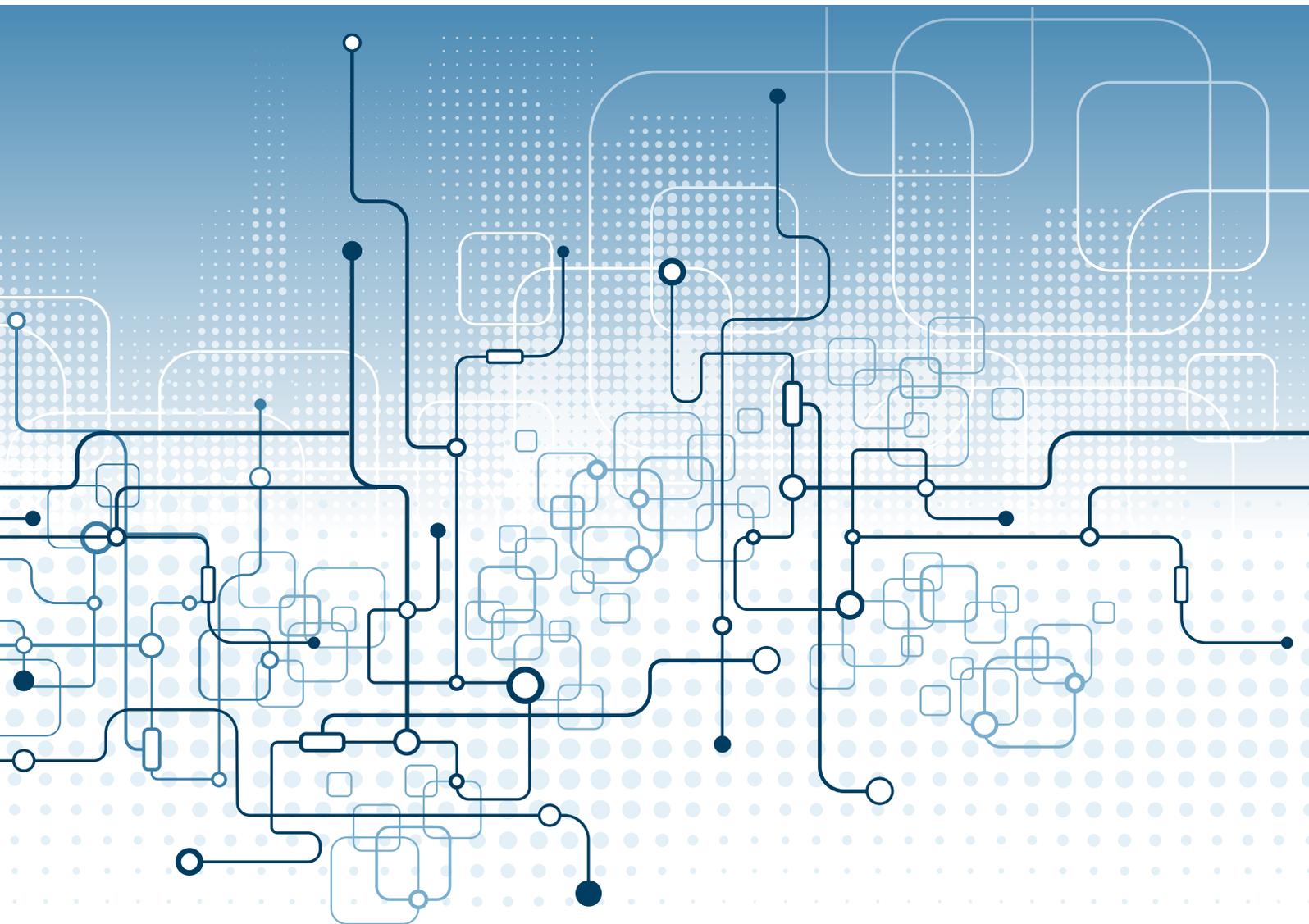
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Federal Ministry
of the Interior

Open Government Data Germany

Short Version of the Study on Open Government in Germany
Commissioned by the Federal Ministry of the Interior



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Contracting entity

Federal Ministry of the Interior

Division O1

Alt-Moabit 101 D

10559 Berlin

Responsible authors

Jens Klessmann (Overall project management and foundations)
Fraunhofer Institute for Open Communication Systems FOKUS, Berlin

Philipp Denker (Project head, organizational framework)
Partnerschaften Deutschland, Berlin

Ina Schieferdecker (Project head, technical framework)
Fraunhofer Institute for Open Communication Systems FOKUS, Berlin

Sönke E. Schulz (Project head, legal framework)
Lorenz von Stein Institute, Christian Albrecht University, Kiel

Additional authors

Petra Hoepner, Evanela Lapi, Florian Marienfeld, Lena-Sophie Müller, Nikolay Tcholtchev (Fraunhofer FOKUS), Katharina Rein-Fischböck (Partnerschaften Deutschland), Kim Corinna Borchers, Timm Janda, Dominic Völz and Thomas Warnecke (Lorenz von Stein Institute)

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1 SUMMARY

The existing information and data portals of the federal, state and local governments offer a good starting point for achieving the goal of open government and public administration in Germany. At the 5th National IT Summit¹ in December 2010, policy-makers, public administration, the private sector and the research community adopted the Dresden Agreement, which states that the next step is to build a centrally accessible open government platform offering open government data in response to users' interest in convenient, standardized and user-friendly access. This platform is meant to link existing federal, state and local data platforms, support additional data platforms, meet the needs of federal, state and local governments and satisfy users' expectations of quality. This platform is intended to improve access to data and information from public administration and help further expand e-government.

This study lays the foundations for open government data and for planning, setting up and running a prototype of an open government platform operating across all levels of government. These foundations include analysing the target group, compiling a catalogue of relevant government data, defining technical standards, analysing the legal framework and terms and conditions of use, examining payment models, and developing an operating model for the open government platform and a governance model for federal, state and local cooperation on open government data in Germany. For this reason, this study focuses on four areas: the foundations and the legal, organizational and technical aspects of open government data. These four areas are treated in the next four sections of the study.

THE FOUNDATIONS OF OPEN GOVERNMENT DATA

This study focuses primarily on open government data. By creating additional transparency, open government data constitute an important element of open government, that is, greater transparency in government and public administration and greater participation and cooperation with citizens.

Openness offers an approach to structuring processes and orienting strategic decisions. Strategies for maintaining and improving government agencies' ability to act are necessary in view of the constant increase in the number and complexity of challenges faced by government and public administration. Up to now, these strategies have been pursued primarily in (internal) optimization of processes and improved organization and less in long-term expansion to third parties outside the own organization. But strategically opening communication, organization and processes by including additional staff, representatives of other public agencies and external actors can add value.

Transparency enables informed decision-making, which in turn provides the foundation for further openness and inclusion of citizens in the dimensions participation and cooperation. For the public to become involved, it must be able to inform itself appropriately. For example, the Freedom of Information Act describes information as the prerequisite for exercising freedom. Freedom of information is an element of modern statehood and an increasingly essential component of

¹ Federal Ministry of Economics and Technology (2010), p. 7.

participatory democracy. Further, it should be noted that the complexity of implementing participatory and cooperative processes is growing in comparison to projects intended to increase transparency. Especially in view of limited resources and the need for public agencies to make cultural adjustments, it is necessary to take a gradual approach and lay the groundwork for further steps by improving the provision of information and data. Within the open government model, the dimension of transparency goes beyond the public's existing information options. In this new understanding, transparency no longer refers only to citizens' ability to gain information from publicly available sources or by submitting requests to the public administration, but to the active provision of information and processes of opinion-formation, assessment and decision-making and the availability of public administration data for third parties within and outside public agencies.

Open government data are those data of the public administration which are made available to third parties for their reuse. Whether the data provided can be described as open depends on various factors, such as accessibility, formats and the legal conditions under which the data may be used. Although there are currently different definitions of the term, there is general consensus on the principles influencing the degree of openness. For this purpose, the principles of open data are applied to public-sector data.

In practice, these criteria sometimes prove difficult to define and measure. Government data made available as open data should be as easy as possible for third parties to reuse. All the criteria mentioned are influential, though some more so than others. In this context, the three criteria of machine readability, licensing and costs of use are especially important. To be defined as open, datasets should meet these three criteria to a certain degree. A certain degree of machine readability is necessary to enable automated processing with relatively little effort. If the terms and conditions for reuse are not formulated so as to allow further use simply and understandably, in some cases data providers and users may have to enter complicated negotiations with an uncertain outcome. If reuse of a dataset is subject to payment, the number of potential users will be smaller and the overall economic effects will be reduced.

In general, the openness of "open data" or "open government data" has less to do with a definable standard situation than with a process of moving towards greater openness of individual organizations by means of greater ease in reusing their datasets. As a result, open data may be open to differing degrees. Openness ranges in a spectrum from meeting a few of the specified criteria for open data to meeting many or all criteria. At the same time, with the appropriate alterations, datasets and information which cannot yet be described as open have the potential to be made available as open data. The necessary alterations may require different amounts of effort.

In addition to clarifying what is meant by "open data", the first part of the analysis focuses on which opportunities and risks or potential and challenges the existence of open government data may offer or pose for the target groups of education, citizens, media, public administration, policy-makers, business, the research community and civil society. A selection is shown in Table 1. The study demonstrates that open data offer different opportunities and pose different challenges for different target groups.

Table 1: Selected opportunities and risks/challenges by target group

Opportunities (out of 50)	Risks/challenges (out of 33)
Improved image and acceptance (PA)	Change in the role of organizations (Bus, Sci, Med, Civ)
Added economic value via additional processing (Bus)	Existing qualifications insufficient (Cit, PA, Civ, Med)
Support for organizations in pursuing their goals (Civ)	Overwhelmed as a result of limited motivation and time, apathy and information overload (Cit)
Access to relevant information as basis for participation in policy decisions and processes (Cit)	Re-identification of data (PA)
Addition to and improvement of scientific results (Sci)	Quality of open data (Bus)

Edu – education | Cit – citizens | Med – media | PA – public administration | Pol – policy-makers |
Bus – business | Sci – research | Civ – civil society

The open government platform for Germany offers the potential to develop and strategically deploy the data offerings of public agencies in line with the needs of the various groups in a modern knowledge society much more systematically. For example, making open data available in standardized fashion yields various links to current strategies, projects and trends in administrative reform as well as social and technological developments.

A federal open government platform for Germany with a focus on providing open government data offers a number of advantages for providers and users of data, such as

- nationally standardized access to open government data
- broader third-party reuse of open government data
- innovation, transparency and participation promoted by standardized data access
- more visibility and improved image for participating agencies
- support for uniform standards, processes and guidelines for the provision of (open) government data; improvement of internal administrative processes

In providing larger and larger quantities of easy-to-reuse government data, over the long term it is important to join these to form a sustainable national data infrastructure compatible with the requirements of a federal system. Appropriate datasets must be found and processed by actors from civil society, the scientific community, business and public administration as efficiently as possible. To do so, the supply of data must be continuously expanded and providers and users of data must be supplied with the necessary tools.

THE LEGAL DIMENSION OF OPEN GOVERNMENT DATA

Analysing the legal foundations shows that publishing government data and allowing their reuse can be understood as a public administration task and thus as belonging to the canon of its traditional tasks (of providing vital services). This does not conflict with the influence of European law in certain sub-areas. Maintaining a sufficient level of transparency and openness as the basis for democratic legitimacy is in line with constitutional law, even if it does not serve as a basis for a direct claim to transparency. This constitutional requirement is directed at both lawmakers and public administration.

Understanding the provision of open data as a public responsibility also demonstrates that the public administration is authorized to take on this new task in the framework of its assigned responsibility (most clearly expressed in the right of local authorities to assume tasks on their own responsibility), where legislation has not already defined publication as an obligatory task, defined boundaries (for example in the form of data protection regulations) or specified modalities (for example in the form of rules on reuse when permitted on a one-time basis). Many of these tasks are voluntary and can be assumed by the public administration on its own initiative.

As with every government task, when publishing government data for reuse it is necessary to differentiate between the legal character of the task, which is always public law, and the tools chosen to carry out the task. Public administration may act on the basis of either public or private law. Also in the context of publishing government data, this applies both to the organizational form chosen for this purpose, such as a joint federal, state and local data portal, and to the form of action. Thus publishing and allowing use in the form of granting rights of use under specific conditions (compiled in so-called terms and conditions of use) may be based on a public-law model or be formulated as a mixed-type use contract. So the existing legal framework hardly limits the data-providing agency's freedom to choose.

The same applies in the framework of government copyright. No matter which legal regime the agency uses, it must provide those works covered by Section 5 of the Copyright Act and in the public domain on this basis; on the other hand, it can allow third-party use for all government works under the Copyright Act by granting rights of use. Outside the Copyright Act's scope of application (because there is no work as referred to in Section 2 of the Act), no absolute rights may be formulated, but the rights holder is responsible for regulating the reuse, for example of data, through relatively effective agreements (private law) or public-law terms and conditions of use.

It seems preferable in most cases to use a public-law model given the classification of publishing government data and allowing reuse as public tasks. According to this view, an open data portal should be classified as a public entity, the individual datasets as public goods, conditions of use as a description of the specific purpose (e.g. excluding commercial use) and any required payments as user fees. Specifying the purpose is the responsibility of the rights holder, as a rule the agency in possession of the data, and is not bound by particular forms of action within the legal framework, so it can also be implied by providing and defining terms and conditions of use. Data provider and data user enter into a public-law use relationship based on the terms and conditions of use and the actual use.

When formulating this task, the agency must comply with the current legal framework, which contains (isolated) rules and requirements on

- the limits of proactive publication,
- the modalities of provision,

- allowed content of terms and conditions of use and
- what price to charge for reuse.

The basic decision on whether to publish data, the choice of legal form, the formulation of terms and conditions of use and payment models are all at the discretion of the responsible agency. The open data criteria may be considered when making these decisions. The criteria, which in some cases are formulated as maximum requirements, are not based on current law (partial exception: freedom from discrimination in the form of the principles of equality and accessibility), but there is no law against using them for orientation.

Terms and conditions of use may legally be formulated on the basis of existing licences. The legal framework limits the freedom of data providers only somewhat, for example with regard to disclaimers, regardless of whether the law on terms and conditions sets limits within private law or whether official liability is an option. A complete exclusion of liability is not possible nor is it intended, in view of the government's general due diligence requirements in fulfilling its tasks.

Terms and conditions of use are the legal result in practice of granting rights of use and setting conditions for use. They govern the use of data, not access to them. The data-providing agency is responsible for defining the terms and conditions of use. These defined rights and conditions for the reuse of data from the providing agency remain valid even if another data portal links to the dataset.

Defining clear terms and conditions of use is recommended for reasons of legal certainty for both the provider and user of data. Another argument in favour of clear definition is the ability to trace the data to their source and the related questions of liability and quality control. Terms and conditions of use may be formulated under private or public law; both options leave sufficient room for manoeuvre.

In principle, a national open government data portal in Germany could use a standard market licence, could adapt conditions developed abroad or could develop its own terms and conditions of use. The analysis of standard market licences and specific conditions developed by foreign open government data portals has shown that both options have disadvantages for a German portal and cannot match the advantages of Germany developing its own conditions of use. It is thus advisable to develop own terms and conditions of use in Germany, while paying attention to common European efforts.

German law does not provide any direct requirements for drafting specifically developed terms and conditions of use. Apart from basic legal aspects (such as non-discrimination), a number of criteria from the open data discussion offer orientation. The utility derived from the reuse of open government data depends on certain rights of use being granted, such as the right to freely reuse, freely share and freely alter the data. These rights represent the minimum level. Granting these rights of use entails restricting the possible conditions of use although doing entirely without conditions is neither planned in the open data discussion nor does it seem to make sense. Drawing a distinction between commercial and non-commercial use and charging fees for commercial use is certainly conceivable and possible.

Drafting own terms and conditions of use for the open government data portal in German covers two categories of content: first, necessary criteria such as coverage of rights and conditions of use, specification of the object of protection and scope of terms and conditions of use (such as spatial and temporal restrictions); second, a series of optional criteria, such as practicality and understandability for a general audience or, if so intended, the separation between commercial and non-commercial use.

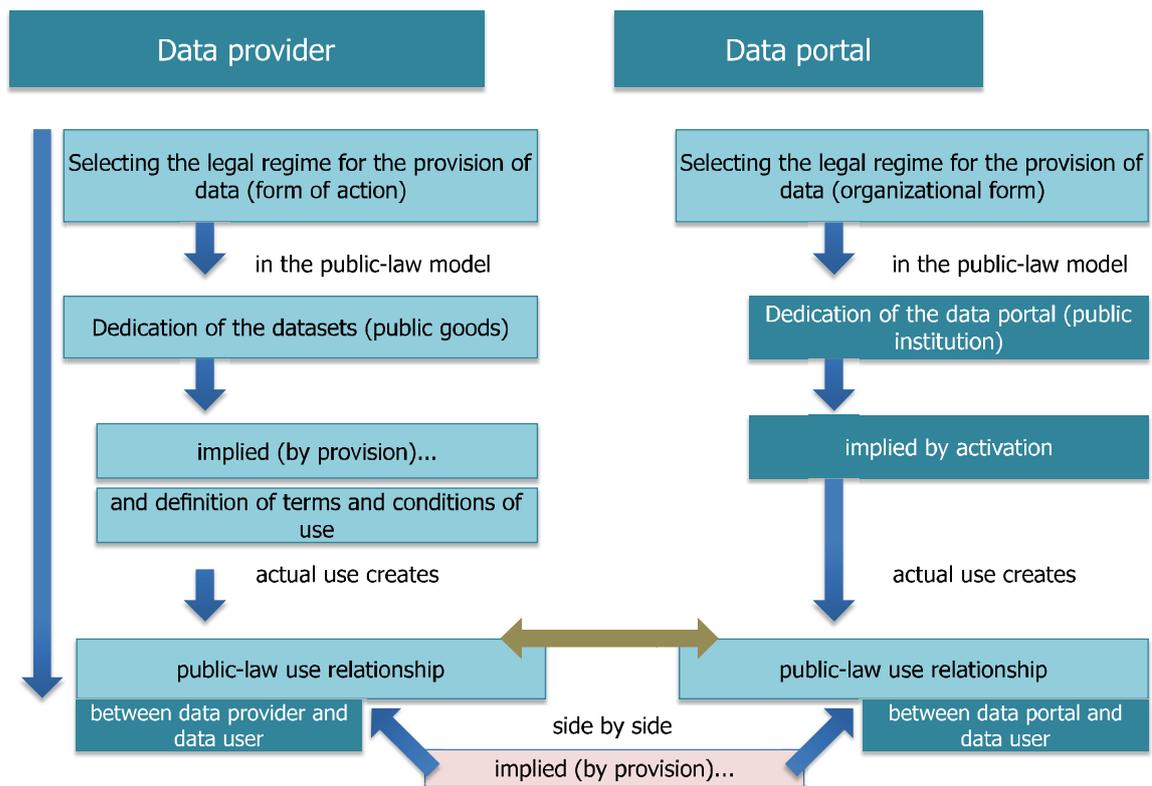


Figure 1: Next steps in selecting a public-law model

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In the interest of a uniform data infrastructure in Germany, it makes sense to create a coherent overall system out of the legal foundations of data and information provision, which still differentiate between access claims, reuse and proactive offerings on the one hand and between different categories of data and areas of administration on the other, and possibly consolidate them in a general information code using uniform definitions.

In addition, there needs to be coordination across the various levels of government. The current legal framework offers useful mechanisms for cooperation and agreement on certain modalities (metadata, terms and conditions of use, fees). Due to its specific tasks, a uniform access portal constitutes an allowable form of mixed administration and can be carried out on the basis of an administrative agreement. Resolutions of the IT Planning Council (e.g. regarding the metadata standard) or legislative mechanisms could be used to make such an agreement more binding.

THE ORGANIZATIONAL DIMENSION OF OPEN GOVERNMENT DATA

Open government data provide the basis and starting point for a long-term, cross-level process of change towards electronically supported open government. Cross-level open government data imply above all cooperation and coordination of a variety of actors within and increasingly outside public administration. Against this background, open government data should also be seen as an organizational challenge. For the open government process to be successful in federal Germany, sustainable organization that defines the rules and principles for cooperation is required.

For this reason, this study focused on three areas of organizing open government data:

- **Payment models** for open government data
- **Governance** for open government in Germany
- **Operator models** for the open government platform

With regard to **payment models**, the goal of the study was to identify appropriate models for charging fees for open government data in light of the framework conditions and implications in Germany's federal system of government. The term "fees" refers both to compensation under private law and to public-law charges for making data available for use. The use of data may require payment or be free of charge. So a payment model is a scheme or system for assigning a price to the use of government data, from being available for payment to being free of charge.

The examination of payment models started with an analysis of the legal requirements and the resulting approaches to payments. Examples of payment models in various data sectors and portals were studied. The analysis revealed a variety of legal requirements for payments which were sometimes in conflict. The power to legislate on payments is divided between different levels. The framework conditions are in some cases expressed in a high level of complexity, specialization and heterogeneity of payment models. The high level of complexity and heterogeneity result in incompatible payment structures at the different levels of government, which makes it difficult to establish a homogeneous supply of government data in Germany. Administering individual contracts for use requires extensive effort by both providers and users of data. Further, complex payment structures inhibit the use of data in particular by potential users in small and medium-sized enterprises (SMEs), start-ups and even in public administration.

However, European and national conditions for payment are currently in flux, and relevant law is in the process of being amended (e.g. Directive 2003/98/EC, Federal Act on Access to Digital Geodata). Characteristic of the amendments, particularly those based on EU directives, is that they limit the options for requiring payment. They also pursue the goal of testing central provision of government geoinformation using a single payment and licensing model in Germany, such as the IMAGI model project.

Despite differences in payment models, certain trends can be identified in (inter)national reform efforts:

- **No charge for using data:** Not charging for the use of data is becoming increasingly common as part of the open government data movement.
- **Strategic reduction of fees:** To encourage data use, numerous data-providing agencies have reduced fees for data use and established simple, standardized payment models.
- **Fees limited to additional costs:** In the process of amending certain legislation, the ability to charge for data use is being limited to the extra cost of making the data available.
- **Payment for commercial data use:** In many cases, payment is required only for commercial data use.
- **"Freemium":** The notion of "freemium" comes from the Internet and media industry and has spread to data-providing agencies. The term refers to a business model in which basic services are provided free of charge while fees are charged for higher-value ("premium") services.
- **Price limits:** Some agencies have followed the lead of private-sector flatrates and are testing payment models with graduated fee levels and maximum price limits.

The anticipated economic potential of data use is the main force behind the drive to simplify payment models and their framework conditions. So government data can be viewed both as a "raw material" for start-ups and new business models and as essential for optimizing business processes in various sectors. The private sector is likely to need more and more government data as technological networking increases. Many government agencies in Europe have opened their databases, reduced fees and simplified payment models in order to stimulate the economic potential of government data. Case studies show a correlation between the fee amount and the use of government data by business, which helps stimulate the economy.

In addition, simpler payment models result in greater utility for public administration. Access to government data also has significant potential to benefit public administration: The provision of open government data encourages networking as well as knowledge and information management within public administration. Simple payment models or provision of data free of charge also reduce the administrative burden, e.g. for billing, payment tracking, etc. Providing open government data is an important step towards networked, transparent and efficient public administration. Despite the enormous economic potential of data use, there is reluctance to offer data free of charge or for a minimal fee on a large scale. Apart from the decentral division of competences and legal obligations to charge for services, the main reason is the need of certain agencies to recoup their investment and infrastructure expenses by charging for the provision of data. Dependence on such funding varies by agency. But alternative forms of financing and greater use of data while reducing charges could be considered. And analyses of cost-effectiveness should weigh revenues against the administrative burden of providing data.

Given the complex framework conditions, a practical approach to payment for open government data is recommended. For example, all payment models and decentral billing should be allowed on the open government platform, as creating the largest possible supply of data and networking data offerings via the platform have priority. At the same time, however, the different payment models should be harmonized over the medium to long term in order to ensure that data offerings are compatible. To do so, the federal, state and local governments should agree in the medium term on joint pricing principles for the use of data. Lastly, an outline for joint pricing principles will be formulated.

With regard to **governance**, the goal of the study was to describe an organizational structure (governance model) to serve as the long-term basis for open government cooperation between federal, state and local governments, with an initial emphasis on open government data. In the context of this study, the term governance refers to coordination between the actors at different levels of government involved in advancing open government in Germany. With regard to governance, the study intentionally refers to cooperation in the area of open government in order to reflect the function of open government data as the foundation for open government and the related process of and potential for development. And this part of the study is intended to describe a model for financing cross-level cooperation on open government in Germany, above all an open government platform.

In examining governance, the study defines core functions that governance must fulfil in the context of open government. On the one hand, these functions are based on the federal and state goals, intentions and priorities for advancing open government in Germany; on the other hand, these functions are derived from the needs for action identified in the study with regard to strategic, organizational, legal and technical framework conditions for open government data. Four functions of governance for advancing open government have been defined:

- providing a basis for cross-level, voluntary cooperation on open government;
- producing decisions and results, such as common principles for setting prices for data use, uniform terms and conditions of use and (meta-) data standards for open government data;
- coordinating supply and demand, i.e. the needs of target and user groups and the data, information and formats for participation offered by public administration;
- securing funding and resources, i.e. the partners providing financial and other resources for cooperation, with a focus on the open government platform.

Requirements for governance in the sense of critical factors for success were also formulated:

- **Political commitment:** For open government to have lasting success, it needs political commitment at every level of government and a powerful high-level sponsor.
- **Acceptance:** To create acceptance for the results of governance, it is necessary to integrate both target and user groups as well as potential data providers at an early stage, i.e. first of all in building the open government platform.
- **Viable structures:** Governance should be implemented efficiently and sustainably by building on existing, functioning structures of decision-making.
- **Effective mechanisms for growth:** As the number of topics grows, governance must remain capable of decision-making, i.e. effective mechanisms for growth (multiple levels of expansion, access to top-level management, etc.).

In building up governance, existing experience and organizational structures can be used. In this way, during the project, relevant actors were mobilized to a high degree and structures were created that in some cases can be expanded. And the experience and structures of federal IT cooperation can also be utilized for open government. The study proposes a governance structure calling for gradual expansion in the course of developing open government and recommended a basic model that can be implemented in a short time and focuses on cooperation in the area of open government data and on operating an open government platform. Over the medium to long term, this model can be expanded into a comprehensive model of governance that provides for cooperation in additional areas of open government and for institutionalized public participation. An administrative agreement and equal federal and state funding of the open government platform are recommended as the basis of national cooperation on open government.

With regard to **operator models**, the goal of the study was to develop an appropriate operator model for the open government platform, describing several options and recommending one model as a priority. Against the backdrop of the goals and priorities formulated by the federal and state governments, a "federal operator model" was adopted as the general goal. In this context, "federal" means that the future operator will be supported by all levels of government; in the sense of IT management, it also implies that the platform operation will be overseen by the IT Planning Council.

Existing operator models relevant for open government were identified and analysed in developing the operator model for the open government platform. The analysis focused on open government data operator models in Germany and abroad as well as on experience with similar projects on federal IT cooperation and specialized data networks in Germany. Taking the framework conditions and strategic goals for open government into account, the requirements a future operator organization will need to meet were described. Various institutional options for implementing the operator model were then developed and evaluated.

The requirements for the operator organization were drawn from the following sources:

- the federal and state governments' strategic goals and policy requirements for open government (data);
- what target and user groups require of an open government platform;
- the implementation status of decentral open data platforms in Germany (above all state operators);
- best practices of operator organizations, i.e. the range of tasks and services of foreign open government data operator organizations at national level;
- technical requirements, i.e. requirements of the task and services of the operator resulting from open data technology.

Based on these requirements, the operator profile was described with regard to the following aspects:

- Role and function: The operator should function as coordinator and "operational driver" for cross-level open government data and implement the governance decisions.
- Tasks and services: The operator's core tasks should lie within the areas of strategy and basic policy, operations, development and support, and communication and marketing.
- Long-term developments: The operator's services may be expanded in the course of the open government development process (e.g. additional information services, procedures for electronic participation, etc.).
- Qualifications, profiles and resources: The operator profile should include management, platform maintenance, data management/support and communication/marketing.

In view of the experience with open government data abroad and the experience with specialized data networks in Germany, the study recommends creating a viable operator organization with sufficient resources at its disposal. Staffing should be regarded as critical to success in order to run and further develop open government data professionally. In the interest of cost-effectiveness, resources should be pooled.

Three options for implementing the operator organization were described and compared:

- Coordinating authority: establishing a central national coordinating authority for open government in Germany based on best practices from abroad
- Cooperation model: public-public cooperation in operating the open government platform via an operator of a decentral open data platform or an operator of a specialized data portal
- Partner model: Hiring a private service partner to operate the open government platform

Based on the discussion of implementation options, the coordinating authority as operator model is recommended for the open government platform. For successful, cross-level open government in Germany, joint federal–state organization is needed which, by coordinating the actors, effectively contributes to providing and networking the data collections and creating central access to the federal supply of data. To build the open government platform, a specialized operational protagonist with a mandate from all partners is needed. The model of a coordinating authority best meets these requirements.

THE TECHNICAL DIMENSION OF OPEN GOVERNMENT DATA

Along with legal and organizational issues, the technical implementation of provision plays an important role in providing open government data in Germany. An open government platform

with a focus on open government data will be created in a landscape of different standards and platforms. It is important to integrate the relevant existing platforms for data provision and IT standards in the cross-level system of German public administration and to build on them where it makes sense to do so. At the same time, the open data approach makes various demands on datasets. From a technical perspective, these requirements must be compared with applicable agreements in Germany's system of e-government, so that the approach can be implemented by the federal, state and local governments without difficulty.

An attractive supply of data is one of the most important components for a successful open government platform. Public agencies have various sizes of information and data collections, in various levels of quality, at their disposal. Due to the large number of public agencies and local government bodies, it is not possible within the framework of this study to produce an exhaustive overview of existing data services. However, a manual and semi-automated inventory was taken using qualitative and quantitative methods to identify a selection of suitable datasets and potential data providers.

The manual inventory was based on a brief questionnaire distributed to nearly 200 federal, state and local government agencies. The inventory was intended to analyse and select existing data collections for the purpose of building a data catalogue. To this end, datasets were identified, described and checked for their suitability to be included in a subsequent data catalogue. The response rate of about 10% in the form of completed questionnaires or URLs was within the typical range for a survey in paper form.

The manual inventory was able to lay the groundwork for a data catalogue. Out of 4,539 datasets reported, 1,759 were classified as open datasets. The main reasons the remaining datasets were not classified as open were insufficient machine readability, permission only for private use or use only for a fee.

Measures to further improve the reusability of data sets classified as open include for example communicating terms and conditions of use more clearly or transforming the data into formats which are even easier to use. Analysing the group of datasets classified as not open yielded the following approaches for improvement: Structured content requires provision in formats which are easily processed or at least permission for non-commercial reuse of the datasets.

The manual inventory should be distinguished from the semi-automated one, as it considered fewer datasets but was able to examine them in greater detail. The advantage of the semi-automated inventory, by contrast, is that it allows general conclusions to be drawn about a large number of datasets.

In the semi-automated inventory, 719 websites of various institutions and entities at federal, state and local level were examined for publicly accessible datasets and documents (i.e. resources). The random samples taken in this way yielded indicators of the potential for open government data in Germany. The semi-automated inventory found 67,634 documents and datasets at all levels of government.

Ninety per cent of the resources analysed in the semi-automated inventory were in PDF files. A random manual examination of the PDF resources found that in some cases, a significant proportion of these resources contained structured information (up to 56% depending on the

institution examined). In these cases, providing the data in other formats (e.g. XLS, CSV) could be a relatively simple way of increasing their ability to be processed.

It makes sense to include the institutions and entities identified with relatively large numbers of datasets as actors in the ongoing process of building a federal open data platform.

The analysis of the inventory makes clear that public agencies are certainly capable of providing datasets as open data. Doing so would not even require an unusual amount of effort. In particular those institutions which have been providing geodata, environmental data or statistical data for some time have extensive experience in data provision. These actors offer valuable skills which can be helpful in the implementation of open government data.

But the inventory analysis also showed how much potential there is for improvement. Most of the datasets analysed are now available as PDF files. In many cases, additional or alternative formats could be used which would make it easier to process the data further. And the conditions under which datasets may be used are often unclear, so formulating terms and conditions of use in easy-to-understand licensing provisions would be an important step towards open data.

The goal of the technical analysis was to identify technologies and standards relevant for the open government platform for Germany (OGPD), to evaluate their suitability and make corresponding recommendations for the fields of metadata, data, security and platforms.

For the analysis and evaluation, two procedures were combined: best-practice analysis and the evaluation of Standards and Architectures for E-Government Applications (SAGA). The best-practice portals chosen represent both differing data providers and various areas where open data can be used. SAGA is binding for the federal administration when choosing its information technologies. SAGA offers a system for classifying technical specifications which was also applied to the selected specifications for open government data. The specifications for open government data were divided on the basis of type into tables, data, documents, graphics, geoinformation, geoservices, linked open data and metadata. If a standard was already classified in SAGA, the classification was applied. Further specifications not listed in SAGA were assigned an OGPD classification based among other things on the evaluation of the best-practice examples.

With regard to metadata standards, it should be noted that both ISO/CSW and DCAT/CKAN require seamless support. Because it has the necessary flexibility and is used throughout the EU and across different domains, DCAT/CKAN is recommended as an internal standard.

At the data level, the recommendation is to allow a wide variety of formats. However, due to their technical openness, some formats are more suitable than others; in particular, tables in XLSX or CSV format have clear advantages over data that can only be published in a PDF report. Recommendations for formats and procedures which promote standardization should be drawn up.

The open government platform for Germany must be protected by means of information security management. This study considered the relevant security aspects by roughly assessing the value of OGPD information and tasks to determine the need for protection. The need for a "normal" level of protection was found for the basic values of confidentiality, integrity and availability. Access to the OGPD must be free of charge and possible without authentication. But if necessary, data providers can require authentication for users of their data offerings, in which case users

must verify their identity separately with each data provider. Because only authorized persons should be able to add and alter metadatasets on the OGPD, providers of metadata must verify their identity at the portal. Roles and authorization will be assigned to metadata providers and staff of the portal operator based on authentication by the user administration.

For platform technology, Drupal or Java-based Frameworks are the main possibilities. The widely used Java portal system Liferay is recommended in order to be able to use Java technology, which is better for larger portals, while ensuring compatibility with Government Site Builder. Further, the study authors recommend using CKAN as data catalogue; it is already widely used in the open data area and also has an established CSW interface which enables a large proportion of the existing geodata and environmental data to be linked automatically.

2 RECOMMENDATIONS

Based on the analyses in the areas of strategy, law, organization and technology, recommendations for implementing open government in Germany follow. These recommendations were presented in the individual sections and are repeated here. The focus is on recommendations for implementing the segment on open government data, which is regarded as the essential foundation for advancing the aspects of participation and cooperation. To participate in policy and administrative processes and decisions, individuals, civil society organizations and public agency staff need the latest data and information. Greater cooperation and joint services provided by public administration and citizens require a shared basis of knowledge.

The recommendations are given in the form of a title and a brief description. They are divided into the dimensions of strategy, law, organization and technology. Each recommendation comes with a time frame: short term (approx. 1.5 years), short to medium term, medium term (2–3 years), medium to long term, and long term (approx. 5 years). The numbering of the recommendations does not indicate priority but is intended to aid in ease of use.

Table 2-1: Overview of the recommendations

No.	Title	Time frame
1	Taking a comprehensive view of open government – systematically connecting open data, participation and cooperation services	medium to long term
2	Opening new access channels and promoting participation – providing application programming interfaces (APIs) for data collections of central indexes	short term
3	Creating a strategic dimension of open government data through cooperation and partnerships	medium to long term
4	Not limiting data offerings to open government data – opening access for third-party data, e.g. data collected by volunteers, scientific or economic data	short to medium term
5	Using open government data as a tool to promote economic growth	short to medium term
6	Systematically promoting data skills – reducing shortages of skilled workers and narrowing the digital divide	medium to long term
7	Actively offering open data and paying attention to demand	short to medium term
8	Offering open government data designed with particular target groups in mind	short to medium term
9	Communicating open government data to specific target groups – motivating data providers, demonstrating usefulness to public administration	short to medium term
10	In providing data, cooperation is more important than going it alone. Building a federal open government platform	short term
11	Agreeing on standard terms and cross-level and interdisciplinary use within the legal framework of information management law	medium term
12	Including all relevant government areas in open data activities	medium term
13	Using freedom of choice with regard to performing tasks – coming up with a binding definition of a public-law regime for publishing data	short term
14	Ensuring rights of use and relevant rights of influence when performing public tasks in cooperative or private-law form	medium term
15	Keeping personal data separate from other data using technical and organizational means, taking additional legal measures as needed	medium term
16	Data should be published in early stages of processing as far as allowed by law	medium term
17	Formulating aids to argumentation in discretionary decisions	short term

18	Drawing up future contracts with external data editors or processors so as to allow publication	short term
19	Increasing regulation of proactive publication obligations	medium term
20	Understanding the publication of government data and permission of reuse as a government task	short term
21	Defining rules for deciding whether to publish in every organization or agency	short term
22	Attention to the open data criteria in public-sector discretionary decisions	short term
23	Creating a coherent system of access claims and proactive publication	short term
24	Defining access and reuse, clearly structuring the legal foundations	short term
25	Making the distinction between commercial and non-commercial use transparent and legally certain	short term
26	Clearly documenting the act of dedication	short term
27	Formulating an administrative agreement for an OGD portal	short term
28	Using existing instruments or creating new ones to ensure uniform metadata standards, terms and conditions of use and payment models	long term
29	Consolidating existing cross-level data portals on a consistent legal foundation	long term
30	The legal framework for federal, state and local governments needs further development with regard to legal certainty for publication and data use	medium to long term
31	Formulating standard terms and conditions of use	short term
32	The largest possible supply of data has priority – allowing various payment models on the open government platform	short term
33	Agreeing on common principles for setting prices for data use	medium term
34	Striving for cooperation and standardization in accounting	medium to long term
35	Finding a political power sponsor for open government, encouraging political support at all levels	short term
36	Building viable governance structures	short term

37	Opening governance to participation – utilizing social actors as sources of ideas	short to medium term
38	Institutional location as a success factor – Locating responsibility for open government platform at a high political-administrative level	short term
39	Providing the operator organization with resources for regular operations – personnel as a basic prerequisite critical to the success of open government data	short to medium term
40	Deciding on cooperation soon, putting the operator organization to work in the near future	short term
41	Automatically including georeferenced datasets based on CSW	short term
42	Structured data	short term
43	Prepare OGPD for linked data	medium term
44	Defining binding standards	short to medium term
45	Security strategy for the open government platform	short to medium term
46	Security regulations for applications	medium to long term
47	Establishing organizational processes for depersonalization	short to medium term
48	Mirroring strategy for open government data on data providers' portals	medium term
49	Using the OGPD prototype for evaluation	short term
50	Non-discriminatory access	short term
51	Barrier-free access	medium term
52	Creating a lasting supply	medium term
53	Standardizing the OGPD metadata schema	short to medium term
54	Forward-looking plan for expanding the open government platform	short to medium term

Recommendation 1

Taking a comprehensive view of open government – systematically connecting open data, participation and cooperation services

Content dimension: Strategy

Time frame: medium to long term

Model open government comprises the dimensions of transparency, participation and cooperation. Creating transparency by providing open government data can be essential to informed participation and cooperation between public agencies and the public. To realize this potential, all three dimensions of open government must be linked. In the context of public participation processes for policy decisions, for example, this means that the basic data relevant to the decision are published in context at an early stage in the process or that the participants are informed of their existence. For example, in participatory budgeting, budget data should be available as open government data to make it easier for local initiatives to make their own assessment of the data for the public's information.

Recommendation 2

Opening new access channels and promoting participation – providing application programming interfaces (APIs) for data collections of central indexes

Strategy/technology

short term

In Germany, there are various public-sector projects, key elements of which are the aggregation of data and knowledge and their use. Two examples are the single government service telephone number 115 and the catalogue of services. It is obvious that, as a result, public administration has large quantities of data which third parties are interested in using and reusing. For public administration, opening the directories and content of the knowledge management systems offers the opportunity to create new access channels, thereby encouraging participation and involvement; it also offers the chance to promote interconnection between the individual projects, leading to greater distribution and networking effects.

The databases of central directories such as 115 and the catalogue of services should be made accessible via the provision of programming interfaces. As in the case of the U.S. "Open 311" interface, interested individuals, businesses and NGOs should be given access to the data collections in order to program their own (web) applications for these interfaces and make them available to the public.

Recommendation 3

Creating a strategic dimension of open government data through cooperation and partnerships

Strategy

medium to long term

Information and structured data play a central role in processes and decisions of public agencies. The systematic provision of data is a central aspect of many administrative reform projects. Opening government data can provide new impetus for information-based reform projects and strategies. Open government data can be integrated into these projects. At the same time, data that play a role in these projects can in some cases be made available as open data (see also [Recommendation 2](#)).

There should be networking via cooperation and partnerships with other projects at the various levels of government. To take advantage of this potential for use, the diverse services need to be systematically networked, among other things via the open government platform for Germany.

Recommendation 4

Not limiting data offerings to open government data – opening access for third-party data, e.g. data collected by volunteers, scientific or economic data

Strategy/technology

short to medium term

From the point of view of private citizens, combining open data and related services to reflect relevant life phases or everyday situations can be advantageous. From the user's perspective, ideally it should not matter whether the data come from public, private or non-profit providers. For this reason, in principle it should be possible to integrate clearly marked third-party data, such as data collected by volunteers, scientific or economic data, with purely administrative data, to provide the most relevant data for target groups. In this way, it would be easier for the target group of private citizens to access data relevant for their particular life situation regardless of what organization the data come from. Target groups should be able to participate when combining data for specific target groups. Over the medium term, the open government platform for Germany should also allow third parties to enter data in line with certain standards.

Recommendation 5

Using open government data as a tool to promote economic growth

Strategy

short to medium term

Administrative data that are easy to process further can help knowledge-based companies advance their business. Open government data can help companies, for example by reducing barriers to creating knowledge- or data-based products and services. Data can then be combined in innovative and previously unforeseen ways to provide new value-added services. Open data should therefore be used at all levels of government as a tool to promote business and should be considered when developing relevant strategies.

Recommendation 6

Systematically promoting data skills – reducing shortages of skilled workers and narrowing the digital divide

Strategy

medium to long term

Various segments of society face the challenge of needing new skills to deal with large quantities of data in general and open government data in particular. The lack of sufficient skills can create extra work or even keep work from getting done. At the same time, working with growing quantities of data is predicted to have major economic potential.

As the need for data skills is likely to grow, for example in the fields of data analysis and management, this need should be integrated in plans for education, training and continuing professional development, possibly in the context of the larger field of promoting media literacy. Here, investment in advanced training should focus in particular on those target groups likely to work increasingly with data (such as data providers in public agencies) or as multipliers of relevant skills (such as teachers and instructors in youth and adult education).

In order to make it easier for target groups with limited resources to take part in social processes on the basis of open data, education and training to increase data skills play an important role in dealing with unequal opportunities in access to information and communications technology ("digital divide"). Handling open data also requires understanding their significance in the context of participation and cooperation processes in open government.

Recommendation 7

Actively offering open data and paying attention to demand

Strategy	short to medium term
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A key element of the open-data approach is the idea that different target groups will use government data for different purposes and that opening data collections to third parties will result in the development of new uses for the data. Public agencies must therefore publish data proactively to create attractive offerings for potential data users and encourage creative uses (see also recommendations 19, 20 and 32). At the same time, it is necessary to monitor the use of data provided soon, in order to orient the supply of data on the demand and thus optimize the provision of data. To assess the demand for data, mechanisms for queries about datasets and for submitting suggestions for applications based on open government data can be offered via an open government platform for Germany. The platform's statistics on use will serve as an indicator of interest in individual datasets.

Recommendation 8

Offering open government data designed with particular target groups in mind

Strategy/organization	short to medium term
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A key component of the open government model is continuing the trend of orientation on client needs, i.e. the needs of those at whom public services are directed. In the context of publishing data, different target groups have different interests, or differing levels of interest. For example, private citizens may be more interested in data with local relevance and issues of transparency and participation, while companies may be more interested in data having a certain quality, for example with regard to granularity, or in licensing terms. These different interests should be considered when designing open government data services.

This may be achieved in the context of an open government data platform for Germany, for example via the targeted grouping of data, applications and tools or via flexible mechanisms for searching and selecting data on the platform (see also [Recommendation 54](#)).

In order to collect and continuously update the necessary information about target groups' needs, mechanisms should be sought which enable cooperation and exchange between data providers and central actors of the various target groups.

Recommendation 9

Communicating open government data to specific target groups – motivating data providers, demonstrating usefulness to public administration

Strategy/organization	short to medium term
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Open government data have numerous target groups. They have different demands, interests and roles in relation to open government data. Communication should be used to learn from the experience with numerous underused e-government services, and systematic communication should be invested in. Targeted communication about the introduction should be used to reach the target groups and motivate them to participate. Group-specific messages should be formulated and communication formats and media should be defined. In addition to using suitable communications media (such as animations that are easy to understand and disseminate), multipliers should be identified who can inform and persuade, keep up a continuous dialogue and serve as a link between target groups.

The current discussion of open government data mainly stresses their usefulness for businesses and individuals, although open government data also offer major potential for public administration. To increase public administration's willingness to provide data and invest in open government data, it is necessary to communicate the overall usefulness as the core message of the introduction. Handling open data also requires understanding their significance in the context of participation and cooperation

processes in open government. Communication is crucial to starting a process of change in the public administration's handling of data and information.

Recommendation 10

In providing data, cooperation is more important than going it alone. Building a federal open government platform

Strategy	short term
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Creating a federal portal focused on access to open government data of the federal, state and local governments is necessary in order to implement open government in Germany. It will be an important building block of the information and knowledge society. The advantages it offers for data providers and users include the following:

Standardized nation-wide access to open government data is user-oriented and promotes innovation ("one-stop shop"); more extensive reuse of government data; support for uniform standards, processes and guidelines for providing open government data; and a higher profile for participating agencies thanks to greater national and international visibility of regional data services and applications.

Recommendation 11

Agreeing on standard terms and cross-level and interdisciplinary use within the legal framework of information management law

Law	medium term
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The current legal framework for publishing government data and permitting reuse is difficult to follow, not only because it is split into different laws; these laws also use different interpretations of terminology, especially of data and information. Agreement in the different fields and at the different levels of government on standard terms would make things much easier for public agencies providing data and for data users. Provisions on claims to access, limits on access (applying to both access on request and proactive publication) and modalities of access could be consolidated in the future.

Recommendation 12

Including all relevant government areas in open data activities

Strategy	medium term
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In view of the significance of datasets of public bodies other than the government in the narrow sense, it would be useful to organize the open data activities so that other bodies could participate, for example by entering data in a common portal. This applies to legislative bodies and courts and especially to local and functional self-government as well as to public and public-private companies. From a legal perspective, special circumstances would have to be taken into account, but there are no fundamental objections to such expansion.

Recommendation 13

Using freedom of choice with regard to performing tasks – coming up with a binding definition of a public-law regime for publishing data

Law	short term
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Due to the freedom of choice in the performance of tasks, every organizational unit should decide whether to regard publishing and permitting reuse as making public goods available in the form of a dedication (public-law solution) or in the context of a civil-law contractual relationship. For all data to be published for the first time in the future, this fundamental decision should be retained and visibly

documented for the public (see [Recommendation 26](#)); older data could be transferred to the preferred model as far as possible. There should be cross-level agreement on the fundamental legal regime; it is not possible or useful to make a binding decision in favour of one model. Because publishing government data is classified as a public task, a public-law model is the logical choice.

Recommendation 14

Ensuring rights of use and relevant rights of influence when performing public tasks in cooperative or private-law form

Law

medium term

Including all government areas ([Recommendation 12](#)) is recommended in order to have the largest possible collection of data available that can also be published for reuse. This applies in particular to the performance of administrative tasks in cooperative structures or in private-law form. Based on the applicable legal framework, the public administration must be assured of its rights of control, either contractually or under company law, for example allowing the publication of traffic data from public transport companies, data from local energy utilities, etc. Otherwise, the decision would be the responsibility of these independent organizational units because of their legal autonomy.

Recommendation 15

Keeping personal data separate from other data using technical and organizational means, taking additional legal measures as needed

Law/technology

medium term

Even though the obligation to keep personal data separate from other data at all times is mandated by law only in limited areas, there is still a legal obligation to ensure compliance with the applicable legal restrictions using appropriate technical and organizational measures. This applies not only to personal data, but also to all sensitive data as a general principle. Keeping personal data separate from the very beginning makes later publication easier for participating agencies and also effectively protects legal interests covered by confidentiality provisions.

Recommendation 16

Data should be published in early stages of processing as far as allowed by law

Law/strategy

medium term

In view of the aims of open data, public administration should start publishing data in the early stages of processing (in the sense of raw or basic data or the primary source) as far as allowed by law. In some cases, a certain amount of processing is needed (to ensure quality or remove personal identifiers); in other cases it is needed to minimize liability. Where such restrictions do not exist, there can be no objections on the grounds that the data provider would lose control over the interpretation of the data; it must be made clear to the relevant public administrations that their power to interpret and process the data is not being restricted, but that additional actors are being added.

Recommendation 17

Formulating aids to argumentation in discretionary decisions

Strategy	short term
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Because the publication of government data for reuse is hardly limited or determined by law, the decision to publish is at the discretion of agencies acting on their own responsibility. The same applies to the definition of terms and conditions of use and payment models. To encourage agencies to publish as much data as possible, it would be helpful to clearly formulate arguments in favour of publishing and permitting reuse and to provide qualitative and quantitative support for them, for example by giving expected bureaucratic relief or additional tax revenues in figures. This could permanently increase willingness to publish in view of tight public budgets.

Recommendation 18

Drawing up future contracts with external data editors or processors so as to allow publication

Law	short term
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As in the case of creating or processing data in private-law forms or in cooperative organizations ([Recommendation 14](#)), the public administration should draw up its regular contracts so that data collected or processed by external partners can be published without restrictions. To do so, the necessary contract provisions must be developed and included as standard in service contracts.

Recommendation 19

Increasing regulation of proactive publication obligations

Law	medium term
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In the process of further developing the legal foundations (see also [Recommendation 23 and 24](#)), the law should mandate more proactive publication obligations on the model of subject-specific requirements (e.g. Section 10 of the Environmental Information Act (UIG)) or state law (Bremen Freedom of Information Act). This would help counter any reservations about whether the public administration can define publication as a task on its own responsibility. Further, the extent and modalities of publication could be appropriately defined and a legal basis created for charging fees and for disclaimers (see also [Recommendation 30](#)).

Recommendation 20

Understanding the publication of government data and permission of reuse as a government task

Strategy	short term
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For many legal aspects, it appears necessary to make clear that the publication of government data for the purpose of reuse is understood as a government task. The background is the government's function of providing vital services, its obligation to guarantee democratic openness and in some cases to promote economic growth. A new task means that the legal framework then requires further development (see [Recommendation 23 and 24](#)). Characterizing this as a public task also helps counter any reservations about the public administration's authority to publish data on its own responsibility and to increase acceptance for any costs related to the new task.

Recommendation 21

Defining rules for deciding whether to publish in every organization or agency

Law	short term
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Where agencies can decide on their own responsibility on publication and reuse, in the absence of regulations it is advisable to make proactive publication binding for agencies or organizations, for example in the form of service instructions or administrative regulations. So it would be conceivable to determine who decides on publication using what procedures and which terms and conditions of use should be applied as a standard, if no cross-level or interdisciplinary agreement on standards yet exists.

Recommendation 22

Attention to the open data criteria in public-sector discretionary decisions

Law	short term
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In the absence of comprehensive regulations, the basic decision on whether to publish government data, the choice of legal form, the formulation of terms and conditions of use and payment models are all at the discretion of the responsible agency. The open data criteria may be considered when making these decisions. The criteria, which in some cases are formulated as maximum requirements, are not based on current law (partial exception: freedom from discrimination in the form of the principles of equality and accessibility), but there is no law against using them for orientation, which should serve as the starting point for open data activities.

Recommendation 23

Creating a coherent system of access claims and proactive publication

Law	short term
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In view of the concurrent limits to publication in responding to information requests and in proactive publication, it would make sense to include both constellations in a consistent legal framework, for example by covering both aspects consistently in a general information code. But even without doing so, it is possible within the current legal framework to avoid contradictions between fulfilling claims and publishing proactively. Comprehensive and complete publication is suitable for reducing the number of requests and must anyway comply with restrictions required by access laws (e.g. for reasons of data protection).

Recommendation 24

Defining access and reuse, clearly structuring the legal foundations

Law	short term
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In order to handle government data with legal certainty, access must be clearly distinguished from reuse in a way that laws so far fail to do. In particular, it has not yet been clarified whether access claims include rights of reuse and if so, which kinds of use and purposes are specifically covered. Clarifying the terminology for all subject areas and levels of government would be helpful (see also [Recommendation 11](#)); in particular, lawmakers are free to classify certain forms of action.

Recommendation 25

Making the distinction between commercial and non-commercial use transparent and legally certain

Law	short term
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If the agency providing the data wishes to differentiate between commercial and non-commercial use in its conditions of use and/or payment models, it would be help to define ahead of time which specific

uses constitute commercial and non-commercial use. Even outside a legal definition, it is conceivable to include legal definitions in the terms and conditions of use in the context of discretionary decisions, thereby giving data users the necessary legal certainty.

Recommendation 26

Clearly documenting the act of dedication

Law short term

If the agency decides in favour of a public-law or private-law model, it must ensure that all data of this organization will be handled the same way in future and that this decision is clearly documented for data users. The current situation is unsatisfactory in this regard, as in case of doubt the agency is unclear as to which legal regime applies to the publication and reuse of data, and users rarely have detailed knowledge of licensing and copyright law. So it is advisable to make it clear which of the two conceivable options one is using and to use only the usual terminology for that option; additional information can help provide binding documentation of the choice of legal form.

Recommendation 27

Formulating an administrative agreement for an OGD portal

Law short term

In view of the possibility to rely on existing specialized data portals and other federal, state and local collaboration, formulating an administrative agreement in the short term seems conceivable and useful. It is more appropriate than a "project structure" for giving all participating levels legal certainty, especially because decisions made in the context of a project (e.g. on metadata standards, conditions of use, payment models) can hardly be questioned later, which is likely to significantly limit acceptance by actors who were not involved. An open administrative agreement which allows additional agencies to join later can be drawn up in a way that gives legal certainty (example: D115).

Recommendation 28

Using existing instruments or creating new ones to ensure uniform metadata standards, terms and conditions of use and payment models

Law long term

The current lack of consistency with regard to metadata standards, terms and conditions of use and payment models is detrimental to legal certainty. Cooperation and understanding between the different levels regarding the shared platform is helpful initially, but over the long term more legally binding mechanisms should be used to ensure consistent treatment. Depending on the object of consistency, different instruments are conceivable (IT Planning Council decision, legislation); the principles decided on can then be based on those agreed on an informal or contractual basis.

Recommendation 29

Consolidating existing cross-level data portals on a consistent legal foundation

Law long term

Over the long term, the goal should be to overcome the diversity and co-existence of different structures of cooperation between federal, state and local governments in the field of open data, and possibly beyond, and to use existing uniform structures or create new ones. Consolidating steering bodies and offices created on the basis of different administrative agreements (GDI-DE, PortalU, possibly OGD portal) is conceivable, as is assigning individual functions to existing bodies (e.g. the IT Planning Council) to reduce duplication.

Recommendation 30

The legal framework for federal, state and local governments needs further development with regard to legal certainty for publication and data use

Law medium to long term

To enable provision in public-law form, the legal framework for federal, state and local governments may have to be amended. Where necessary, it would require for example authorization to publish, to create a legal basis for charging fees, for exemptions from liability and for one-party definitions of terms and conditions of use. It is necessary to ensure that the local level has a sufficiently flexible legal framework, where this is not currently the case (such as in the case of exemptions from liability).

Recommendation 31

Formulating standard terms and conditions of use

Law short term

To put the handling of government data and the permission of reuse on a legally certain basis, standard terms and conditions of use need to be formulated.

Terms and conditions of use should make it possible to permit the reuse of government data in public-law regimes and on the basis of civil contracts. They should be drawn up in cooperation and be based on standard licences and existing solutions for open data.

Formulating standard terms and conditions of use soon is the basis for consistent application of the law across the various levels – whether these are binding and in which procedure must be decided over the long term. In the short term, standard terms and conditions of use should be understood as an offer to the participating administrations.

Recommendation 32

The largest possible supply of data has priority – allowing various payment models on the open government platform

Organization short term

Creating the largest possible supply of data and networking data collections are priorities in the phase of building the open government platform. It should also be possible to offer data for a fee on the platform, in order not to exclude government geodata, which can be used in many ways, and to emphasize the unifying character of the open government platform. But most of the data should be open government data offered free of charge. Setting prices for data subject to a fee should be based in the medium term on common principles (see [Recommendation 33](#)). Competition arising from a transparent supply of data can lead to a levelling of prices and an expansion of supply in the medium to long term. To ensure user friendliness, it should be clearly indicated whether government data are available free of charge or subject to a fee.

Recommendation 33

Agreeing on common principles for setting prices for data use

Organization medium term

Given the differences between payment models and to encourage cross-level compatibility, common principles for setting prices for data use in Germany should be agreed.

Recommendation 34

Striving for cooperation and standardization in accounting

Organization	medium to long term
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An accounting service should be regarded as an optional (expansion) component of the open government platform in the medium to long term. For reasons of practicality and to encourage the largest possible number of services, in the medium term data providers should be responsible for accounting. An isolated solution in the field of accounting services would not be efficient in economic terms nor effective in terms of IT strategy. To identify an appropriate, single accounting service, both the current developments in the geodata sector and existing solutions in the private sector should be considered. Since fees are mainly charged in the sector of government geodata, cooperation with the actors associated with GDI-DE should have priority, if possible, and (shared) use of the GDI-DE accounting component should be sought.

Recommendation 35

Finding a political power sponsor for open government, encouraging political support at all levels

Organization	short term
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Successful open government needs broad political commitment at all levels of government due to its cross-level importance and the necessary cultural transformation of policy-making and administration. It will be especially important to find a powerful sponsor and further high-level supporters for the project who identify with the development of open government.

The open government target and user groups – in particular users of open government data – could help gain the support of policy-makers from the bottom up, through the use of new media.

Recommendation 36

Building viable governance structures

Organization	short term
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Open government data must be coordinated effectively across all levels of government. Common principles and shared standards for cross-level open government data should be drawn up and agreed on as part of federal coordination of governance. Common principles and shared standards should be agreed at least with regard to terms and conditions of use, metadata and fees. This requires governance able to make decisions with high-level political-administrative support and effective mechanisms for growth. Building on tried and tested structures is advisable in order to establish federal and state governance in the near term.

For building the open government platform, it is advisable to agree initially on a "compact" governance structure (the basic model; see III-4.5.2 in the full version of the study). The governance structure should be gradually developed depending on the future priorities of the open government process and open to public participation (the comprehensive model; see III-4.5.3 in the full version of the study; see also the recommendation "Opening governance to participation – utilizing social actors as sources of ideas").

Recommendation 37

Opening governance to participation – utilizing social actors as sources of ideas

Organization	short to medium term
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Open government data must live up to their name and provide for consistent, systematic and early inclusion of target and user groups. The interaction format should be drawn up in open coordination with the target and user groups. In the process, it should be noted that modern participation includes electronic formats ("e-participation") which are more tailored to the preferences of the target and user

groups (see III-4.5.3 and III-5.3.2.2 in the full version of the study). So it is necessary not only to address the desire for participation appropriately, but also to find the right format for participation and further develop it together.

Governance should shape and drive the thematic development in the direction of open government. In order to include ideas, feedback and requests from the larger society in the discourse, governance requires a body which includes social actors (open government consultative council). This body should advise public administration in developing open government. At the same time, this body should challenge participating administrations to implement innovations and try new forms of cooperation; it should also keep a critical eye on the implementation efforts of public administration. The proposed open government consultative council is such a body in the context of governance.

Recommendation 38

Institutional location as a success factor – Locating responsibility for open government platform at a high political-administrative level

Organization	short term
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According to experience elsewhere in Europe, the institutional location of the open government platform is critical to its success. In all the countries considered, responsibility for coordinating cross-level open government data and for operating open government platforms was located at a high political-administrative level.

Based on this experience, a location at a high political-administrative level is also recommended for the German open government platform.

Recommendation 39

Providing the operator organization with resources for regular operations – personnel as a basic prerequisite critical to the success of open government data

Organization	short to medium term
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The operator organization of the open government platform must have qualified staff and sufficient resources for regular operations. Sufficient staff and resources are necessary to operate open government data professionally and develop them into a core competence.

Because open government data require cross-level coordination and promotion, pooling resources to ensure successful and cost-effective open government data in Germany is to be preferred.

Significant understaffing or limiting the operator's role to technical operations would result in an open government platform without sufficient networking or uptake. Before creating an open government platform, it is therefore necessary to be aware that a living platform requires an active operator with staff who help create attractive services for the platform. So the operator organization's staff resources are a basic prerequisite critical to the success of open government data.

Recommendation 40

Deciding on cooperation soon, putting the operator organization to work in the near future

Organization	short term
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The federal and state governments should decide soon on cooperation as well as on the role and assignment of an operator organization for the open government platform, so that the platform or a prototype can be turned over to a qualified operator. It is very important to start the recruitment of data providers and the conceptual development of the open government platform before going into regular

operations, so that attractive data services can be offered as soon as regular operation starts.

With operational responsibility for the platform, the operator has a key role in the design of the open government platform and thus major influence on its success.

Recommendation 41

Automatically including georeferenced datasets based on CSW

Technology	short term
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While the prototype of the open government platform for Germany (OGPD) is in operation, it is necessary to evaluate how an INSPIRE-based data catalogue (in particular Geoportal.DE) can be machine-read (e.g. via CSW) and made available via CKAN. To do so, a process should be developed for efficiently importing existing INSPIRE-based metadata for the OGPD prototype.

Recommendation 42

Structured data

Technology	short term
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The possibilities for reusing documents are greatly limited when documents are created only to be displayed and printed out. This applies especially to PDF and HTML documents. For this reason, the structured data used to create the text documents should be published as soon as possible. If this is not possible, they should be exported in XLS or CSV format.

Recommendation 43

Prepare OGPD for linked data

Technology	medium term
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Establishing uniform, semantically rich access to open government data increases the usefulness for various target groups. So OGPD services should be designed from the beginning with specific target groups in mind, such as special data configurations and possible tools, as well as own community services. Value-added technologies of semantic data (linked data) can be added or integrated in the OGPD offerings later. Another important element is defining key/value pairs that can be freely chosen in the OGPD metadata schema to address information to specific target groups.

Recommendation 44

Defining binding standards

Technology	short to medium term
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If a standard was already classified in SAGA, the classification was applied. This is why only "recommended" standards are listed for certain data categories. At least one standard for tables and possibly for other data categories should be classified as "binding" in order to increase interoperability.

Recommendation 45

Security strategy for the open government platform

Security	short to medium term
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A security strategy needs to be drawn up for the open government platform for Germany. The portal software (e.g. CKAN) should be tested for vulnerability related to the web presentation (penetration tests), backend communication, data processing and data retention. Penetration tests should be conducted at regular intervals.

Recommendation 46

Security regulations for applications

Security	medium to long term
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Apps are external systems and will not be provided directly on the open government platform. Should apps be provided on the open government platform as part of a future expansion, concrete security regulations will need to be established and the apps will have to be checked.

Recommendation 47

Establishing organizational processes for depersonalization

Organization	short to medium term
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If data are able to identify specific persons, suitable organizational processes will have to be established to depersonalize the data, for example by not publishing certain datasets or by adjusting the original depersonalization function (e.g. by changing the granularity: neighbourhood instead of street, increasing the smallest unit per entry, or the like).

Recommendation 48

Mirroring strategy for open government data on data providers' portals

Security	medium term
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A strategy for mirroring open government data on the portals of the data providers would make sense in the medium term for reasons of availability.

Recommendation 49

Using the OGD prototype for evaluation

Technology	short term
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Carefully choosing the architecture, components and tools for the OGD platform will guarantee its lasting usefulness and expandability. The OGD prototype should be used to address and resolve questions such as the choice of metadata schema, keywords, portal technology, register technology, platform backup, etc. The OGD prototype should not create facts on the ground but should serve instead as a technical reference for decisions on technologies and processes for the OGD platform.

Recommendation 50

Non-discriminatory access

Technology	short term
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All data should be available to all users. Users should be explicitly restricted via registration, identification, fees or the like only in well-founded exceptions.

Recommendation 51

Barrier-free access

Technology	medium term
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Open data should be equally accessible to all. It is therefore necessary to ensure that data are published in an accessible way.

Recommendation 52

Creating a lasting supply

Technology

medium term

Open government data should not be a one-time effort but must be viewed as an ongoing task needing regular action, improvement, adaptation and maintenance. Professional users are only interested in data offerings that will be available for the long term.

Recommendation 53

Standardizing the OGPD metadata schema

Technology

short to medium term

The OGPD platform will be a useful information portal when the metadata provided on the OGPD platform conform to a single metadata schema supported by all actors. For this reason, an OGPD metadata schema should be developed for the prototype on the basis of the study's recommendations. This schema should be updated regularly in line with national and international developments. Having the Coordination Office for IT Standards take responsibility for the maintenance of the OGPD metadata schema is therefore recommended. Those responsible for the OGPD should also be active at EU level to help design a European open government data metadata schema compatible with the German schema.

Recommendation 54

Forward-looking plan for expanding the open government platform

Technology

short to medium term

Establishing uniform, semantically rich access to open government data increases the usefulness for various target groups. However, building on the experience of various specialized domains and the initial operation of the open government platform, it is also necessary to promote further expansion for specific target groups, such as special data configurations and possible tools, as well as own community services. Further, the open government platform should be designed so that value-added technologies for creating and processing semantic data (linked data) and for evaluating data (business analytics) can be connected by users or integrated later in the open government platform offerings. In this context, an important element is defining key/value pairs that can be freely chosen in the OGPD metadata schema to address information to specific target groups.

