OPEN DATA INDEX FOR CITIES

São Paulo - SP

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FGV DAPP

OPEN KNOWLEDGE BRASIL

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ABOUT FGV/DAPP ───

The Getulio Vargas Foundation Department of Public Policy Analysis (FGV/DAPP) is an applied social research center concerned with innovation in public policies, producing advanced analyzes with an intensive use of social networks and interdisciplinary knowledge.
Its mission is to improve Brazilian public administration and the public debate in a networked society through transparency and dialogue between the state and citizenship.

FGV/DAPP has developed a research agenda based on its own analysis methodology, improved since its creation in 2012, and which brings together traditional quantitative and qualitative methods and innovative resources for the processing and analysis of public databases and social networks. It also provides society with a set of data analysis and visualization tools that are easy to understand and access.

The public policy analysis are produced by a diversified interdisciplinary team with backgrounds in areas such as Sociology, Political Science, Anthropology, Linguistics, Economics, Public Administration, International Relations, Statistics, Mathematics, and Social Communication, allied to Information Technology and Design.

ABOUT OPEN KNOWLEDGE BRASIL ───

Open Knowledge Brasil (OKBr) is a non-profit and non-partisan Civil Society Organization (SCO) founded in 2013. OKBr represents Open Knowledge International in Brazil based on an agreement which also dates from 2013.

OKBr uses and develops civic tools, analyzes public policies, works with the journalism of data, and promotes free knowledge to make the relationship between government and society more transparent so that there is more effective and open political participation.

OKBr believes in a world where information is free and available to allow more conscious and intelligent decisions. A world where information and knowledge are within reach for everyone.

ABOUT THE FGV/DAPP AND OKBR PARTNERSHIP

One of the main concerns of FGV/DAPP is the promotion of Transparency, understood not only as the diffusion of public data, but also as the capacity to facilitate the understanding of the information coming from this data. Based on the integration of the use of technology and design, FGV/DAPP disseminates information in a simple and accessible manner about various themes, such as the use of public funds, the origin of donations for election campaigns, and the situation of public services (education, health, transport, security), amongst others.

Taking into account its leading role in the promotion of this agenda, in the second half of 2016 FGV/DAPP formed a partnership with the Open Knowledge Foundation in Brazil (OKBr) with the aim of contributing to the annual collection of information for the national Open Data Index and to the detailing and improvement of the index methodology applied at a subnational level (cities).

This is a pioneering project for the promotion of transparency in Brazilian municipalities, since the index can be used as a tool for the assessment and identification of bottlenecks, in order to provide guidelines for municipalities to improve their open data policies. Ultimately, the partnership between OKBr and FGV/DAPP aims to provide municipalities with tools capable of increasing the effectiveness of their capacity to respond to and dialogue with people.

THE OPEN DATA INDEX FOR CITIES

Data is considered open when anyone is free to access, modify, and share it, subject at the most, to measures which preserve its origin or disclosure[1]. The Open Knowledge Foundation developed the global Open Data Index (ODI) to compare countries in terms of their capacity to open data to individuals, the media, and civil society. The information which composes the index is obtained via a crowd-sourced platform, in other words, from the contributions of local agents linked to the OKFN network in each country, and afterwards revised by open data specialists in each country, producing as a final result a ranking of countries.

The aim of the index is to assess the state of open data policies in each country, taking into account all their characteristics: the type of data released, the formats, access, and the transformation of data into information, amongst others. The index assesses various dimensions, such as public finances, socio-economic, legislative, and electoral data, public services, geo-located information, and environmental indicators.

The index thus offers a reference parameter to all countries about the capacity to provide open data, presenting this information in a clear and easy way of understanding and using, something that is in harmony with FGV/DAPP's Transparency mission.

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1   For further information, see the "Open Definition" at: http://opendefinition.org/

This index already exists for 2013, 2014, and 2015 and is currently being constructed for 2016, using methodology already improved by the experience accumulated throughout this period. FGV/DAPP, through its partnership with Open Knowledge do Brasil (OKBr), was the Brazilian organization responsible for collecting the information that is part of the Brazilian index this year.

However, in addition to the global index, which compares countries, Open Knowledge is making an effort to replicate ODI for the sub-national sphere, especially for cities. In its Brazilian ramification, OKBr received support from FGV/DAPP for the structuring of a pioneering methodology for the application of the index compatible with the reality of Brazilian cities. Amongst FGV/DAPP's contributions were the adaptation of the already existing dimensions of the index to cities and the inclusion of new dimensions important for Brazilian cities: transport, criminality, and education.

Since it is a pilot project, the index will initially be presented for three Brazilian cities: Rio de Janeiro, São Paulo, and Curitiba. The results of the index can be consulted at: http://br-cities.survey.okfn.org/place/sp.
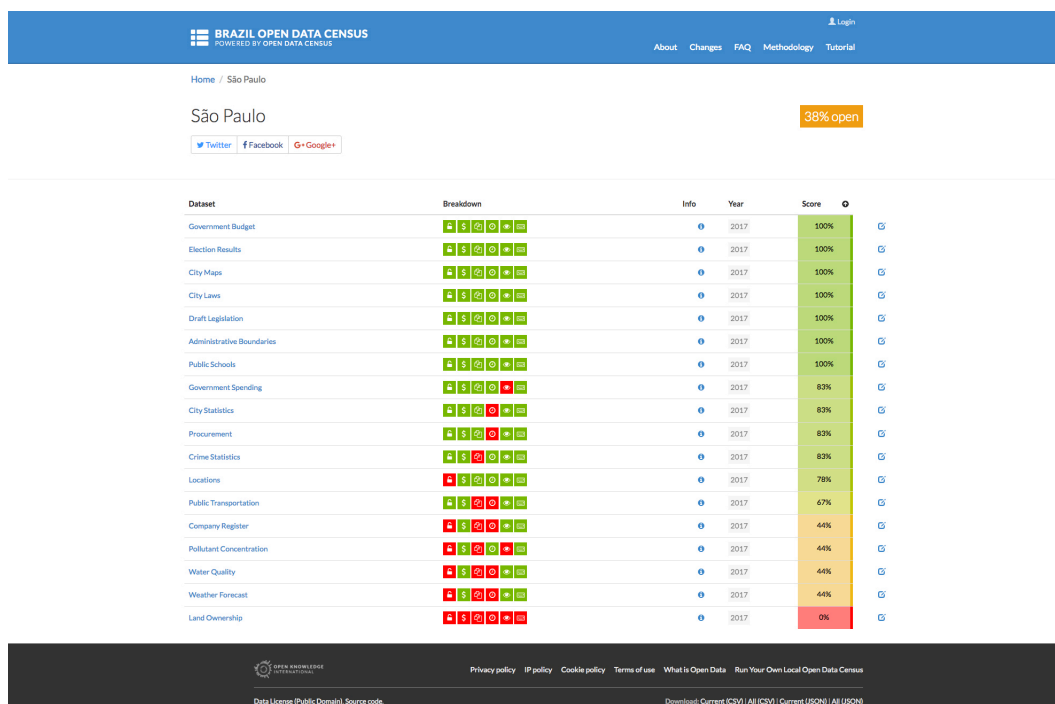
The next section presents the results based on the research carried out by FGV/DAPP for the city of São Paulo. This input can be useful for the preparation of directives for an open data policy at the city level. Afterwards, each dimension of the index will be detailed in order to highlight the sources used, the good practices found, and the main points requiring attention.

Based on the research carried out by FGV/DAPP, it is possible to present some considerations about open data in the municipality of São Paulo. First, the results of the index show that São Paulo has a score of 75%, which can be considered very positive. Although it was not possible to carry out a technically levelled comparison[2], if we use as basis the research done for countries, using a similar methodology, only two out of the 94 countries had an index higher than this.

Within the dimensions of the analysis, as the figure shows below, seven of the 18 datasets assessed obtained a maximum score, in other words 38% of the total, a percentage which appears on the right-hand side in the figure below (in the yellow box). Just one dimension obtained a score of zero.

FIGURE 1 – ASSESSMENT OF TRANSPARENCY DIMENSIONS IN SÃO PAULO[3]

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2   When this report was being written, the research in the other cities was still being revised, which prevents a comparison with results from the same sublevel.
3   This is a set of routines accessible only by programming through which users can access information from software in a direct manner, without necessarily navigating through its traditional interface.

To analyze the state of open data for the city of São Paulo for the base year of 2016, we adopted a methodology for counting the problems found in each dimension and divided the problems found in two types: usability and process. Listed in the first category are problems related to the difficulty in using the data itself and the capacity to transform this into information. As process problems we identified: difficulties of accessing data and the omission/unsuitability of the license. The table below presents the summary of problems in each dimension, ordered from most to least urgent.

FIGURE 2: CLASSIFICATION OF PROBLEMS AS USABILITY AND PROCESS

USABILITY	PROCESS
Incomplete Dataset	Restriction of access
Outdates Dataset	Difficulty of locating data
Unavailability in open format	Download of complete database unavailable
Difficulty of working with data	Non-transparent license

In general, we found proportionally more problems of usability than of process in the municipality of São Paulo. Process problems are most frequent in the dimensions of Company Registration, Pollutant Concentration, Weather Forecast, and Crime Statistics. The frequency of usability problems is greatest in Water Quality, Weather Forecast, and Company Registration.

Among the 18 dimensions of the index, three do not present any bottlenecks, either in relation to usability or to process: City Maps, City Laws, and Administrative Boundaries. These dimensions constitute examples of good practices that can be replicated among the other dimensions. Among the good practices of these datasets are:

APIs (Application Programming Interface)[4][3] for the provision of data about City Laws (Municipal Council), with the possibility of connecting the total amount of data made available through the webservice;

Centralized platform for geolocated information (basic city maps and administrative boundaries), with downloads available in their own formats (shapefiles);

In these cases, we obtained complete and updated databases, in open formats, easy to find, and easily translated into analysis and with transparent usage licenses.

At the extreme opposite are the dimensions of Company Registration are Water Quality and Weather Forecast, which presented problems in almost all assessment criteria. [4] Moreover, the Land Ownership dataset was not publicly found, which prevented its assessment and made it the main critical point of the study. The table below presents the frequency of problems identified per index dimension. Also presented is the administrative body which provided the information (authority and federative level).

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4   The problem assessment criteria are: Incomplete Dataset, Outdated, Unavailability of open format, Difficulty of working with data, Restricted Access, Difficulty of locating data, Download of complete database unavailable, and Non-Transparent License.

FIGURE 3 - RANKING OF OPEN DATA DIMENSIONS FOR SÃO PAULO

RANKING	INDEX DIMENSIONS	BOTTLENECKS FOUND	RESPONSIBLE AUTHORITIES	FEDERATIVE LEVEL
1	City Maps	0	Executive	Municipal
	City Laws	0	Legislative	Municipal
	Administrative Limits	0	Executive	Municipal
2	Public Procurement	1	Executive	Municipal
	Legislative Activity	1	Legislative	Municipal
	Public Budget	1	Executive	Municipal
3	Public Schools	2	Executive	Federal
	Election Results	2	Judiciary	Federal
	Socio-Economic Statistics	2	Executive	Federal
	Locations	2	Executive	State
4	Public Expenditure	3	Executive	Municipal
5	Crime Statistics	4	Executive	State
	Public Transport	4	Executive	Municipal
6	Pollutant Concentration	5	Executive	State
7	Water Quality	6	Executive	Municipal
8	Weather Forecast	7	Executive	Municipal
	Company Registration	7	Executive	State
9	Land Ownership	NA	Executive	Municipal

The most common problem among the databases is the difficulty of working with data, in other words, their usability for carrying out analysis and obtaining information. This criteria refers to the general ease or difficulty with carrying out analysis based on the data divulged, which can depend on factors such as granularity, site organization, and the database itself, amongst others. Second, is the lack of transparency in relation to the type of license for the data divulged, which is a common problem in Brazilian reality (see the table below to understand the frequency with which each problem appears). This information is relevant because it allows citizens and users of the portal to understand their rights in relation to how they can handle, use, and disclose analysis based on a certain database. Third, is restriction of access, found in only two datasets.

FIGURE 4 – FREQUENCY OF PROBLEMS FOUND IN SÃO PAULO

RANKING	BOTTLENECKS MAPPED	FREQUENCY OF IDENTIFICATION OF BOTTLENECKS
1	Difficulty of working with data	10
2	Non-transparent license	8
3	Download of complete database incomplete	6
	Outdated	6
	Incomplete Dataset	6
	Difficulty of locating data	6
4	Open format not available	3
5	Restricted access	2

In six of the 18 dimensions, a problem considered particularly critical in the dimension of usability was identified: the incompleteness of the database (according to the methodological requirements). In the process dimension, the problem characterized as very critical in the study was restricted access (due to the need for identification), identified only in relation to the Public Expenditure and Pollutant Concentration datasets. Below are some of the priorities for action, notably the dimensions that are the responsibility of the municipal executive. The Land Ownership dataset is what calls most attention, since it was not encountered for assessment.

FIGURE 5 – PRIORITIES FOR ACTION

DATASETS	RESTRICTED ACCESS	INCOMPLETE DATASET
Land Ownership	NA	NA
Company Register		✖
Water Quality		✖
Weather Forecast		✖
Public Transport		✖
Public Expenditure	✖	
Pollutant Concentration	✖	✖
Public Schools		✖

● Made available by the Municipal Government

○ Made available by other organizations

In summary, this information can be useful to assist an open data policy in the city of São Paulo, since it can provide paths for the replication of good practices and the correction of points of attention. The benefits of an open data policy are numerous and involve the expansion of administrative effectiveness, the creation of an instrument that demands results from public administration, the encouragement of accountability and social control, the engagement of civil society with public administration, and the improvement of the image of public organizations, with the potential to make it an international reference.

ABOUT THE DATABASES

This section presents comments about the dataset analyzed in order to give the index more depth, explaining the particular questions of each dimension analyzed.

Public Budget (Score: 100%)

Problems found - Process
Lack of clarity about the public data usage license

The public budget was assessed based on the Transparency Portal of the municipality of São Paulo, considered the best source of this information. All the methodological requirements were complied with, but two details require attention: the license was not found on the site, but in general the data is considered public according to the Information Access Law. In this case a specific and transparent license would be important.

Election Results (Score: 100%)

Problems found - Usability
Difficulties of data usability

Problems found – Process
Lack of clarity about the public data usage license

Information about the election results in Brazil is consolidated at the federal level by the Superior Electoral Court (TSE). Although the regional courts collect and make available this information in some cases, the TSE's collection of electoral data is a consolidated and reliable source of information. In this case, the TSE data was assessed in relation to municipal elections (mayor and councilors) in São Paulo. In relation to the index's methodology and the survey fulfillment, all the pre-requirements were met. Nevertheless, two problems were found: the first refers to the difficulty of working with the data, since it is codified. The documentation facilitates the study, but time is necessary to become familiar with the nature of the information. The second problem is related to the license. On the website accessed there is no information about the license or terms of use, but the data is covered by federal information access legislation, as stated by TSE technical staff. In other words, although the data has a public license, it is important that this is made available in the clearest form possible.

City Maps (Score: 100%)

No problems were found with this dataset

The city map information is available on the GeoSampa portal hosted by SMUL - Municipal Secretariat of Urbanism and Licensing of the São Paulo Municipal Government (previously called SMDU - Municipal Secretariat of Urban Development). The map comes in an open format (shapefile and dbf) and can be plotted on different scales. In the options menu, data can be selected about relief, traffic routes, hydrographic basins, and administrative limits. In this case, we obtained complete updated databases in open formats, with clarity in relation to the metadata and usage licenses, easy to find and transform into analysis. The consolidation of georeferenced information in a single portal is considered a good practice for open data in the city of São Paulo.

City Laws (Score: 100%)

No problems were found with this dataset

Information about city laws is available from the Municipal Council of São Paulo. Legislation can be researched per type of regulation, number, year, author, or keyword, and all the information existing about the search is shown. A good practice is the API with the possibility connecting to all the data made available through the webservice.

Draft Legislation (Score: 100%)

Problems found - Usability
Difficulties of data usability

The information about the legislative activity is available at the Municipal Council of São Paulo website. The dimension complies with all the requirements of the index and for this reason receives the maximum score. Nevertheless, it should be emphasized that on the Council site it is not possible to obtain all the information about bills and laws consolidated in a dataset ready to be analyzed. The process to obtain information about a bill occurs in a manual form: it has to be looked for the number of the bill, which contains information about the content, author of the bill, status, and votes. Based on this information it is possible to look for transcriptions of debates which occurred in the plenary session on the day the bill was voted on. The data is also available via API (for this reason the download of the complete database is possible), but for this some basic knowledge of programming is necessary.

Administrative Boundaries (Score: 100%)

No problems were found with this dataset

Information about administrative boundaries is available on the GeoSampa site hosted by SMUL - Municipal Secretariat of Urbanism and Licensing of the São Paulo Municipal Government (previously called SMDU - Municipal Secretariat of Urban Development). The possibility of downloading information about the boundaries of regional municipalities and the districts allow maps to be plotted on different scales and are available in open formats (shapefile and dbf). In this case, we identified complete databases in open formats with available usage licenses easy to find and transform into analysis. The consolidation of georeferenced information in a single portal is considered a good practice for open data in the city of São Paulo.

Public Schools (Score: 100%)

Problems found - Usability
Absence of information required by the methodology: coordinates (addresses, latitude and longitude)
Difficulties of data usability

The Anísio Teixeira National Institute of Educational Research and Studies (INEP) holds the school census every year. This survey complies data from all schools functioning in Brazil. Although São Paulo municipality provides data about school registrations in São Paulo (in the open data portal), this data only covers the universe of municipal schools and contains no information about students enrolments, only about school capacity. The INEP database contains more information and can be downloaded in a single go. The major problem of this dataset is the non-availability of latitude and longitude data of schools. Although there is space for this information in the school census, most schools do not answer this question, which leads to the lack of information. In turn, São Paulo state provides a collaborative map of school locations, however, since the content is collaborative, there is no way to guarantee that all schools are represented on the map. São Paulo municipality provides on its website, latitude and longitude data for municipal schools, but not for all the schools from the city of São Paulo. In this form, there exists a difficulty in working with data, since it is necessary to work with more than one available database — and since information is not presented for the entire existing universe. Nevertheless, according to the attributes of the index, the dataset was given the maximum score.

Public Expenditure (Score: 83%)

Problems found - Usability
Difficulties of data usability

Problems found - Process
Restriction of access to registered users
Difficulty of locating information

The assessment of databases about public expenditure was based on the São Paulo municipality API showcase, which was considered the most wide-ranging database on the subject in the city. Although the Transparency Portal, at the moment of the research, also contained most of the information found without any difficulties in the API showcase, there were some gaps: individual headings (payment orders) and those favoured/suppliers, as well as outdated data. In the case of the database analyzed, the only requirements of the methodology not complied with was free access, since it is necessary to register and obtain a 'token' to access the API consultation system (even though the process can be done by anyone and they are easily guided by the documentation available on the site). Also in relation to the process dimension, the difficulty of finding this data should be pointed out, which can only be analyzed at the suggestion of a specialist who knows the municipal administration well. Moreover, the need to possess programming abilities limits the capacity to use the information.
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Socio-Economic Statistics (Score: 83%)

Problems found - Usability
Outdated Data

Problems found - Process
Difficulty in locating information

The statistics solicited in the original index methodology – GDP, population, and unemployment – are made available at the federal level by the Brazilian Institute of Geography and Statistics (IBGE). As a result, in general the municipalities covered by what is released by IBGE do not produce redundant data, but rather, in some cases, complementary data or estimates. In this case, IBGE data was assessed for São Paulo municipality. Although it complies with most of the requirements of the methodology, the data was not easily found since it was only possible to obtain with different focuses and methodologies in the various parts of the IBGE site. The main problem found was the date the municipal GDP was updated, as it was three years out of date.

Public Procurement (Score: 83%)

Problems found - Usability
Outdated data

The data related to public procurement is available from the São Paulo municipal transparency portal. The information complied with practically all the methodological pre-requisites of the index and is available for download in open format (csv, xml, and xls). Nevertheless, considering the period the assessment was made, the information was not updated in accordance with the monthly regularity required by the methodology.

Crime Statistics (Score: 83%)

Problems found - Usability
Difficulties of usability of data

Problems found - Process
Lack of clarity about the public data usage license
Download of complete database unavailable
Difficulty in locating information

The criminal statistics are provided by the São Paulo State Secretariat of Public Security. Data related to murder, rape, and theft are in one section of the site, while apprehensions of firearms are in another, which hinders the location of data. Moreover, in both cases it is necessary to download data from police department units. In this way, the files have to be downloaded separately to consolidate the necessary information in a single set of data. Permission for the usability of the available data is also not clear.

Locations (Score: 78%)

Problems found - Process
Lack of clarity about the public data usage license
Difficulty in locating information

Although the São Paulo municipal government releases on its open data pages a dataset of addresses, the assessment was based on a cartographic database created by the Center of Studies of the Metropole of Universidade de São Paulo (USP), which is a state university, as it provides more updated data. The problems found were the difficulty in finding information (even though it was not imperative to register, it is necessary to insert an e-mail to reach the page with the links) and the absence of a clear license about data usage.

Public Transport (Score: 67%)

Problems found - Usability
Absence of information required by the methodology: timetables per line and station/stop, connections between the different modes of transport
Outdated data
Difficulties of usability of data

Problems found - Process
Download of complete database unavailable

In general, the databases for public transport are broken down among various different sources, which is no different in the case of São Paulo, preventing the download of the complete database and limiting the usability of data. Four sources were assessed, three of which were from the municipal administration (Geosampa Portal, Open Data Portal, and SPTrans) and one state (CPTM). The first source contains information about BRT (Bus Rapid Transit) corridors, itineraries, and train and metro stations, terminals,

bus stops and itineraries, and a cycle lane map. Information about timetables was found in a separate form, in the other links. No information was found about timetables per line and station/stop for each mean of public transport, nor the connections between the different modes of transport in a single database. The data was outdated at the moment of the research according to the Geosampa metadata. The main point of attention refers to the data about train journeys, whose updating data states that it is 'on demand.

Company Register (Score: 44%)

Problems found - Usability
Absence of information required by the methodology: unique company identifier
Unavailability of open format data
Outdated data
Difficulties of usability of data

Problems found - Process
Lack of clarity about the public data usage license
Download of complete database unavailable
Difficulty in locating information

Company registers for the city of São Paulo appear on the page of the Board of Trade for the State of São Paulo, from which the state government is responsible. However, its usability is restricted: it is neither possible to know the periodicity of the updating of the information provided, nor to download the database. It is impossible to know if the data made available by the search on the site contains the universe of all the companies registered in the city. It is always difficult to find information per company, while the data usability license is not clear, making the capacity to work with this data arduous.

Pollutant Concentration (Score: 44%)

Problems found - Usability
Difficulties of usability of data
Absence of information required by the methodology: volatile organic compounds

Problems found - Process
Lack of clarity about the public data usage license
Download of complete database unavailable
Restriction of access to registered users

The data about air quality and the concentration of pollutants in the city of São Paulo are collected and provided by a state organization: the Environmental Company of São Paulo State (CETESB). In the area of usability, the difficulty of consolidating and using the desegregated information stood out. All the information required by the methodology was found (particulate material, sulphur and nitrogen oxides, carbon monoxide, ozone, and the availability of the monitoring station, or zone), except for volatile organic compounds. In the process item, most important is the need to register to access the database: even though there is no prior limitation on who can register, this hinders access to data. Moreover, it is not possible to download all the data all at once, since the system only allows partial extracts from the database, albeit in an open format. Also of importance is the non-availability of the public data usage license.

Water Quality (Score: 44%)

Problems found - Usability
Absence of information required by the methodology: levels of arsenic, fluoride, and total solids dissolved per water source
Non-availability of data in open source
Outdated data
Difficulties of usability of data

Problems found - Process
Lack of clarity about the public data usage license
Download of complete database unavailable

The Municipal Water Quality Surveillance Program for Human Consumption of São Paulo (VIGIAGUA) administered by the Municipal Secretariat of Health, presents regular bulletins about water quality in the city which contain information about the presence of fecal coliforms and nitrates. However, in the assessment only data about conformity or non-conformity was found, there are not greater details of the information collected. Another problem about this availability is related to the format: the bulletins are in PDF, which hinders the manipulation of the data. The updating of the data is another question, taking into account that there is a temporal hiatus of around four months in relation to the data available for the final analysis. Moreover, the absence of a historic consolidated database for download, the lack of clarity about the public data usage licenses, and the difficulty of finding information about the state of the database means that this dimension is one of the principal points of attention for the city of São Paulo.

Weather Forecast (Score: 44%)

Problems found - Usability
Absence of information required by the methodology: forecast for at least four days with average temperature, wind velocity and direction, probability and quantity of precipitation
Non-availability of data in open source
Outdated data
Difficulties of usability of data

Problems found - Process
Lack of clarity about the public data usage license
Download of complete database unavailable
Difficulty in locating information

Information about the weather forecast was found on the site of the São Paulo municipal Emergency Managerial Center (CGE). The data was not easy to find because it was necessary to first search for the climate conditions and afterwards reach the weather forecast. In addition, the only information provided is the forecast for extreme temperatures, and furthermore, only for the current day and the next two days. All the others (forecast for the current day and the next four days containing average temperature, wind direction and velocity, probability and amount of rain) were not found. The database is not available in an open format, at least not for download, which hinders data usability. It is only possible to see it on the web. No license was found for the public use of data.

Land Ownership (Score: 0%)

This dataset was not found.

There is no public data about land ownership in São Paulo as required by the index methodology. The GeoSampa portal, run by the municipal government provides digital maps of São Paulo, however, on this site it is not possible to download data about the property division of the city. Since the municipal administration has a charges taxes on land ownership in the city, it is known that this information exists, however, it is not publicly available.

CONCLUSION

In general, the city of São Paulo achieved a positive result in the index, obtaining a total score of 75%. Only one dataset was assessed at 0%, another four obtained a score less than 50%. Of the other 13 datasets with scores higher than 50%, seven received the maximum score. Most of the problems identified were more related to usability (completeness, updating, and format) than to the process (means of access and data usage license).

The principal good practice found is the consolidation of geo-referenced information in a single portal, which provides data in an open format. The most critical problem, according to the analysis of this research, is the incompleteness of the databases, i.e., certain information considered essential for the theme in question was not available. This problem appeared in six datasets, four of which are made available by the municipal government itself.

This research report can help the data opening process in the city of São Paulo, by directing attention to the priority dimensions and the most common priorities and problems in accordance with the definition of the Open Knowledge Foundation. In other words, this document contains some directives for an open data policy for the city of São Paulo.

Furthermore, this initiative can have a series of benefits, both internally and externally the public administration. Internally, because the data opening process creates a mechanism of internal demand for results from different units, which contributes to greater effectiveness in public administration. In addition, the opening of data allows individuals to contribute in various ways, whether with analyzes, social control, the creation of applications, or the replication of information, amongst others, which makes administration more efficient by congregating efforts through the participation of society. On the other hand, there are external benefits: municipal administration comes to be seen as more accountable to its citizens, which implies not only gains in terms of image, but also in the possibility of becoming a national and international reference in open data.

FGV/DAPP and OKBr thereby make recommendations based on the preliminary research results in three areas: first, the need to synchronize the form of the presentation of the
open data in all dimensions, if possible consolidating them in the same repository. The design of specific solutions for the problems reported in each dimension seeks to establish good practices, which involves the standardization of the process to format the release of open data and the design of action strategies for each type of administrative unit (since the databases are made available by various types of entities).

In second place, the considerations of this report can assist the construction of a municipal open data plan which covers the commitment to ambitious open data targets.

In third place, and no less important, it is recommended that innovative forms of information presentation be implemented through the creation of a data visualization methodology. The idea is to go beyond the simple release of information, aiming at guaranteeing that the final consumer of the data can appropriate it in an agile and intelligible manner, stimulating the use of data for more effective public policies.

SOURCES ——

Listed here are the sources used (including the links accessed) for the assessment of the index's dimensions. The agencies which provided the information and the type of information (authority and federative unit) are mentioned.

It is important to highlight that the assessment was carried out for the state of open data in 2016. The sources were consulted in the period of the research, 1 - 30 December 2016. The revision process and the inclusion of new dimensions of the index was carried out between January and February 2017.

Public Budget

Municipal Government of São Paulo
Municipal Executive

Transparency Portal of the Municipal Government of São Paulo
http://transparencia.prefeitura.sp.gov.br/contas/Paginas/LeiOrcamentoAnual.aspx

Election Results

TSE - Superior Electoral Court
Federal Judiciary

Repository of Election Data
http://www.tse.jus.br/eleicoes/estatisticas/repositorio-de-dados-eleitorais

City Maps

SMDU - Municipal Secretariat of Urban Development, Municipal Government of São Paulo
Municipal Executive

Geosampa Portal
http://geosampa.prefeitura.sp.gov.br/PaginasPublicas/_SBC.aspx#

City Laws

Municipal Council of São Paulo
Municipal Legislature

SPLegis Portal (Legislative Process System)
http://www.camara.sp.gov.br/atividade-legislativa/splegis-consulta/

Draft Legislative

Municipal Council of São Paulo
Municipal Legislature

SPLegis Portal (Legislative Process System)
http://www.camara.sp.gov.br/atividade-legislativa/splegis-consulta/

Administrative Boundaries

SMDU - Municipal Secretariat of Urban Development, Municipal Government of São Paulo
Municipal Executive

Geosampa Portal
http://geosampa.prefeitura.sp.gov.br/PaginasPublicas/_SBC.aspx#

Public School

INEP Anísio Teixeira National Institute of Educational Study and Research
Federal Executive

Registration and administrative responsibility per school(School Census)
http://inep.gov.br/microdados

Public Expenditure

Municipal Government of São Paulo
Municipal Executive

API Showcase of the Municipal Government of São Paulo (API/SOF)
https://api.prodam.sp.gov.br/store/apis/info?name=SOF&version=v2.1.0&provider=admin

Socio-Economic Statistics

IBGE – Brazilian Institute of Geography and Statistics
Federal Executive

Municipal Gross Domestic Battle
http://www.ibge.gov.br/home/estatistica/pesquisas/pesquisa_resultados.php?id_pesquisa=46

Quarterly unemployment rates based on the National Household Sample Research (PNAD) Continuous
http://www.ibge.gov.br/home/estatistica/indicadores/trabalhoerendimento/pnad_continua_mensal/default.shtm

Municipal population estimates
http://www.ibge.gov.br/home/estatistica/populacao/estimativa2015/estimativa_dou.shtm

Procurement

Municipal Government of São Paulo
Municipal Executive

Transparency Portal of the Municipal Government of São Paulo
http://transparencia.prefeitura.sp.gov.br/contas/Paginas/ComprasLicitacoes.aspx

Open Data Portal of the Municipal Government of São Paulo
- Purchase and Auctions
http://dados.prefeitura.sp.gov.br/dataset/base-de-compras-e-licitacoes

E-Business Portal of the Municipal Government of São Paulo
http://e-negocioscidadesp.prefeitura.sp.gov.br/BuscaLicitacao.aspx

Crime Statistics

State Secretariat of Public Security of São Paulo
State Executive

Murder, Burglary, Apprehension of Firearms
http://www.ssp.sp.gov.br/Estatistica/Pesquisa.aspx

Rape
http://www.ssp.sp.gov.br/Estatistica/ViolenciaMulher.aspx

Locations

CEM/USP – Center of Metropole Studies, Universidade de São Paulo
State Executive

Access to database of addresses for the Metropolitan region of São Paulo
http://www.fflch.usp.br/centrodametropole/716

Observation: the data available at the open data portal (http://dados.prefeitura.sp.gov.br/dataset/geocodificacao-de-logradouros-geolog) from the Municipal Government of São Paulo was outdated at the time of the research.

Public Transport

SMDU - Municipal Secretariat of Urban Development, Municipal Government of São Paulo
Municipal Executive

Geosampa Portal
http://geosampa.prefeitura.sp.gov.br/PaginasPublicas/_SBC.aspx

Cycle Lanes
http://dados.prefeitura.sp.gov.br/dataset/ciclovias

Train timetable (CPTM - Companhia Paulista de Trens Metropolitanos)
http://www.cptm.sp.gov.br/sua-viagem/Pages/sua-viagem.aspx

Bus Timetable
http://itinerarios.extapps.sptrans.com.br/PlanOperWeb/

Company Register

JUCESP – Board of Trade of the State of São Paulo
State Executive

JUCESP search tool
https://www.jucesponline.sp.gov.br/ResultadoBusca.aspx

Pollutant Concentration

CETESB – Environmental Company of the State of São Paulo
State Executive

Principal webpage about air quality
http://ar.cetesb.sp.gov.br/

Most recent data available per monitoring station and pollutant
http://sistemasinter.cetesb.sp.gov.br/Ar/php/boletim_por_poluente.php

Map of the Metropolitan Regions of São Paulo with the situation of each monitoring station
http://sistemasinter.cetesb.sp.gov.br/Ar/php/mapa_qualidade_rmsp.php

Time and monitoring station data
*http://sistemasinter.cetesb.sp.gov.br/Ar/php/ar_da-
dos_horarios.php*

Qualar System (Air Quality Information System) which
allows the downloading of information per station in
.csv format. Requires registration for access
http://qualar.cetesb.sp.gov.br/qualar/home.do

Water Quality

**Municipal Secretariat Health of the Municipal Gov-
ernment of São Paulo**
Municipal Executive

Municipal Program for the Monitoring of Water Quality
for Human Consumption in São Paulo - VIGIAGUA
*http://www.prefeitura.sp.gov.br/cidade/secretar-
ias/saude/vigilancia_em_saude/saude_ambiental/
agua/index.php?p=6967*

Weather Forecast

**Emergency Management Center (CGE) of the Mu-
nicipal Government of São Paulo**
Municipal Executive

Online platform for the control of emergencies related
to meteorological conditions with weather forecast in-
formation for the city of São Paulo
http://www.cgesp.org/v3/previsao_estendida.jsp

Land Ownership

Dataset not found

Innovation for Public Policies