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Sustainable Open Data Business Models for NMCAs

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Official Survey Report

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Frédéric Cantat, Joep Crompvoets, Carol Agius and Angela Baker

"Sustainable Open Data Business Models for NMCAs"

Table of contents

SUSTAINABLE OPEN DATA BUSINESS MODELS FOR NMCAS

Official Survey Report

With 12 figures and 2 tables

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Index of Figures

Index of Tables

1 INTRODUCTION

Switching to an open data policy may pose a challenge to the business model of National Mapping and Cadastral Agencies (NMCAs), especially if they are required to generate revenues to cover a substantial part of their operating costs. EuroSDR and TU Delft led in 2017 a research on this topic: *Adapting National Mapping & Cadastral Agencies business models to open data supply: the survey results* by F.M. Welle Donker, J. Crompvoets and B. van Loenen (EuroSDR's Official publication n° 67 – 2017).

In 2019, an important milestone was the publication of the Directive (EU) 2019/1024 of the European Parliament and the Council of 20 June 2019 on open data and the re-use of public sector information. This directive provides (article 14) that publications and re-use of specific high-value datasets such as geospatial or earth observation and environment (annex 1) shall be free of charge from mid-2023 onwards.

Therefore, EuroSDR decided to lead a follow-up, as a repetition of the 2017's action, this time in association with EuroGeographics. This follow-up had two parts once again: a survey and a workshop.

2 Questionnaire of October 2021: set-up and responses

An online questionnaire was available from mid-October to mid-November 2021.

2.1 Questionnaire set-up

The questionnaire set-up started from the 2017's version and introduced small adaptations.

The questionnaire consisted of 22 questions divided into five parts. In the first part of three open questions, the respondents were asked to give the name of their organisation, which country the NMCA originated from, and the name plus the position of the person who completed the questionnaire.

The second part of the questionnaire consisted of two multiple-choice and one open question to provide background information in the context about open data for the NMCA. We asked since when the NMCA supplies open data, if the open data directive (EU n° 2019/ 1024) is transposed in its country or not, and which datasets are the most popular open datasets.

The third part of the questionnaire of eight multiple-choice questions was related to the funding model of the NMCA. We asked how the NMCA is funded before and after the introduction of open data in order to assess the effects that the supply of open data has had on the funding models of the NMCA. We also asked in which way the NMCA funds open data.

The fourth part of the questionnaire consisted of five multiple-choice questions related to legal, technical and organisational interoperability of open data. We asked if the NMCA followed their national open data policy or if the NMCA had formulated an open data policy specifically suited to their position as a self-funding agency. Respondents were also asked which measures the NMCA had taken to ensure the (long-term of) open data, such as publishing (meta)data in open standards, and which measures are taken to assist employees and to facilitate re-users. The last questions of this part provided a list of motivations for open data publication and what the expectations are for open data (the NMCAs could use a Likert scale to rate the statements from (1) not important to (5) very important), and assessed the maturity of open data within the organisations and which effects open data has had on the organisation.

The final part of the questionnaire consisted of four open questions, in which we asked the NMCAs for a vision on the future of open data within the organisation and within the country, and which success factors will contribute the most to a sustainable open data ecosystem.

All the questions were compulsory. The multiple-choice questions often included a free field ('other, namely') to allow respondents to explain their specific case. The questionnaire and its statistics were anonymous. However, the respondents had the possibility to leave their email address in a last non-compulsory open question: 'If you are happy for us to contact you, please leave your e-mail address'.

2.2 Questionnaire target group

The target group of this questionnaire was European National Mapping and Cadastral Agencies. An invitation with the link to the online questionnaire was sent to all EuroGeographics members. On several occasions a reminder was sent. EuroSDR sent the same type of e-mail to its members too.

2.3 Questionnaire response

40 responses were received: 38 completed online and 2 returned by mail (1 PDF form by e-mail and 1 traditional paper mail). After a first analysis, 4 responses were not taken into account, either because some forms were empty or because they were completed twice. 34 of the 36 valid completed questionnaires were returned by NMCAs, one by a LMCA (Local Mapping and Cadastral Agency) and one by a university (we could note that this result is a great shift up (+70%) from the 2017's survey as at that time 20 valid completed questionnaires were returned by NMCAs). Table 1 shows the summary of all responses.

Country	Type of organisation		
	NMCA	LMCA	Academia
Albania	1		
Austria	1		
Belgium	1	1	
Croatia	1		1
Cyprus	**1**		
Czech Republic	1		
Denmark	1		
Estonia	1		
Finland	1		
France	1		
Georgia	1		
Germany	4*		
Great Britain	4		
Hungary	1		
Iceland	1		
Ireland	1		
Latvia	2*		
Lithuania	2		
Netherlands	1		
Poland	1		
Portugal	2*		
Slovak Republic	1		
Slovenia	2		
Spain	2		
Sweden	1		
Switzerland	1		
Ukraine	1		
Total	**38**	**1**	**1**
* some responses were returned twice or empty			

Table 1: Summary of EuroSDR/EuroGeographics questionnaire responses

3 Survey Analysis

3.1 Results of the survey: effects of open data on the organisation

In this section we describe the outcomes of the survey.

3.2 Year in which open data supply was implemented

Eighteen organisations indicated that they started to supply open data before 2014, i.e. 50% of the responses and only three before 2010. There seems to have been an adjustment on this starting milestone among respondents, because in the first wave of the survey seventeen answered 'before 2014' and eight said 'before 2010'. Five organisations have implemented open data since 2019 (the year of the publication of the European Open Data directive) or later, and two organisations indicated that they do not supply open data at all.

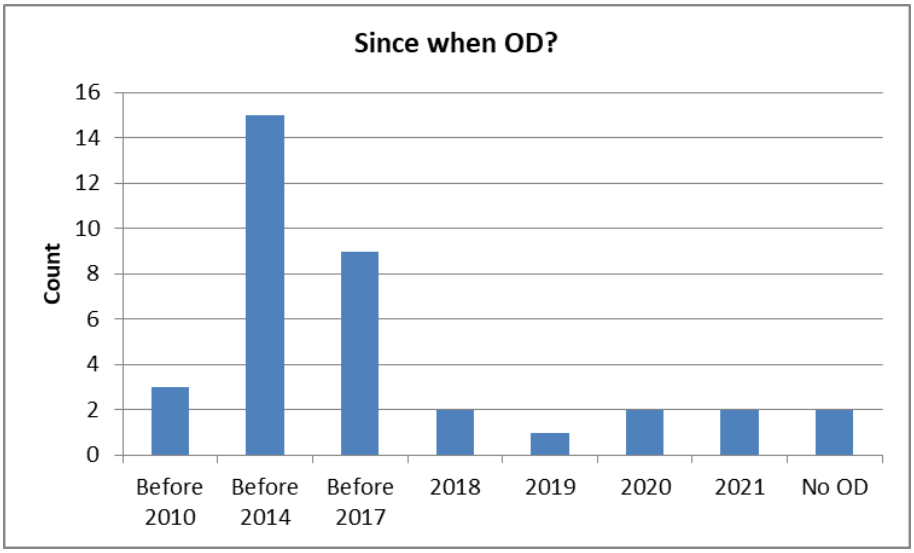


Figure 1: Year of open data supply

3.2.1 Transposition of the open data directive

The Directive (EU) 2019/1024 of the European Parliament and the Council of 20 June 2019 on open data and the re-use of public sector information is supposed to be transposed in each country of the EU since July 2021. However, on 30 September 2021, the Commission called[1] on 19 Member States (MS) to comply with EU rules on open data and the reuse of public sector information and decided *"to open infringement proceedings as part of the regular review of transposition by sending a letter of formal notice"* to these 19 MS.

Nineteen organisations indicated that the open data directive was transposed (eighteen out them supplied the national legal reference of the transposition), while fourteen organisations answered it was not transposed yet and two organisations said that the open data directive was not applicable in their country.

[1] Cf. https://ec.europa.eu/commission/presscorner/detail/en/mex_21_4962

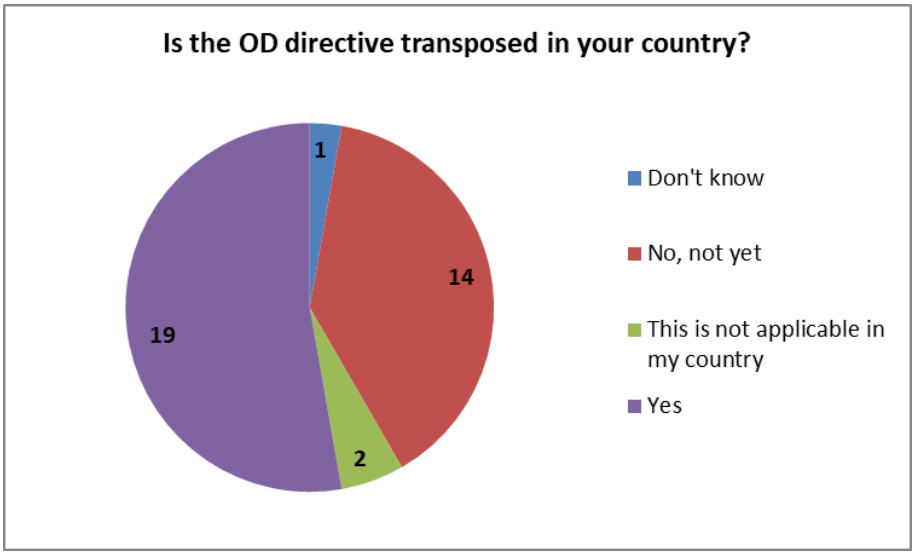


Figure 2: Transposition of the open data directive

3.2.2 Main open datasets (popularity criteria)

The participants were asked to list the names of the open datasets of their organisation and, if more than 5, to list the 5 main open datasets, preferably in order of popularity. 32 out of the 36 respondents provided this information, which means that only 2 out of the 34 organisations that supply open datasets did not respond. The cumulative Top 4 of the 2 main popular open datasets quoted by these organisations are: topographic map (12), administrative data and ortophoto (10) and cadastral map (8).

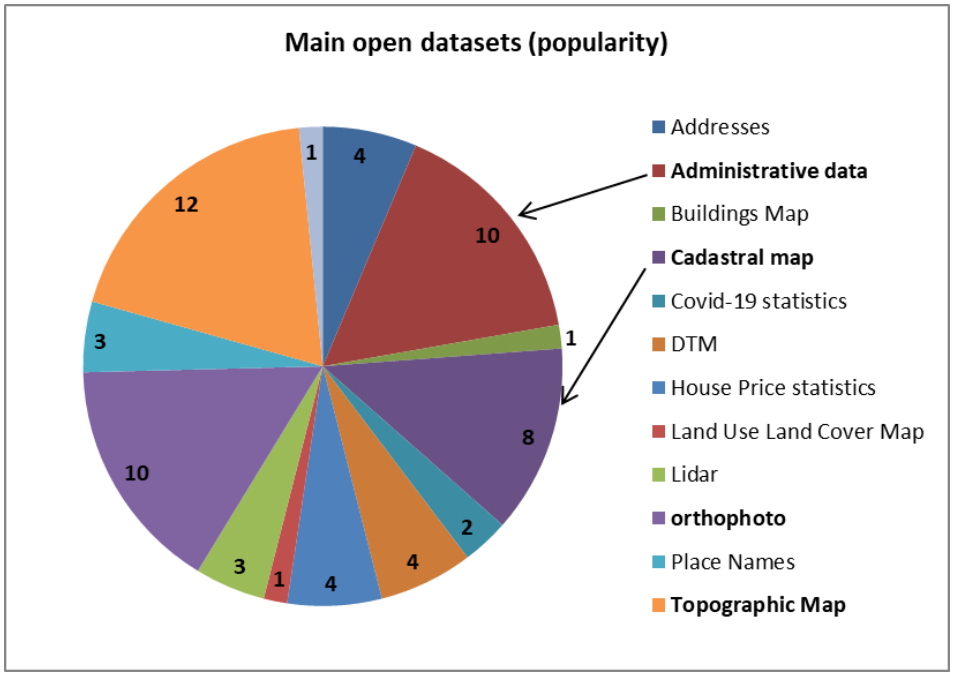


Figure 3: Most popular open datasets

3.2.3 Funding before and after implementation of open data

The participants were asked to provide an indication of the breakdown in percentages of the way in which their organisation is funded before and after the introduction of open data.

25 organisations replied to this question. A general overview highlights that the consequence of the implementation of open data is a light growth of the part of central government funding.

Freq. of responses	Central government funding (general revenue)		specific taxes		Registration / e.g. cadastral fees		fee-based data supply		Fee-based services (tailor-made products, consultancy		other	
	pre OD	post OD	pre OD	post OD	pre OD	post OD	pre OD	post OD	pre OD	post OD	pre OD	post OD
9	100	100	0	0	0	0	0	0	0	0	0	0
1	95	96	3	3	0	0	2	0	0	1	0	0
1	93	98	0	0	2	0	0	0	2	2	3	0
1	92	99	0	0	0	0	8	1	0	0	0	0
1	80	95	0	0	15	15	4	0	1	1	0	0
1	70	70	0	0	0	0	30	30	0	0	0	0
1	70	70	0	0		0	0	20	20	10	10	0
1	70	70			0	0	10	10	0	0	20	20
1	70	85	0	0	0	0	30	15	0	0	0	0
1	70		0		0		15		15		0	
1	60	54	0	0	0	0	20	3	20	43	0	0
1	50	80	0	0	50	20	0	0	0	0	0	0
1	46	59	0	0	0	0	0	0	54	41	0	0
1	40				13		19		28			
1	7	100	0	0	58	0	31	0	2	0	2	0
1	0	0	0	0	0	0	100	100	0	0	0	0
1	0	0	0	0	90	90	5	5	5	5	0	0

Table 2: Funding model of the organisation before and after the introduction of open data, in percentages

3.2.4 Funding of open data activities

The organisations were asked to indicate in which way they finance open data activities and were allowed to select more than one option. 34 organisations answered this question. Twenty-six (twenty-two saying it directly plus four saying it in the 'other' cell) of the organisations (76%) receive (extra) compensation from the national government. Internal efficiencies were selected by 38% of the respondents. A quarter of the respondents said that they had (extra) revenue from other data related services. In the category 'other', organisations mainly mentioned *'from state budget'* (4 times), *'through grants for specific works for ministries, public agencies or local authorities'*, *'through responding to calls for projects from public funding desks'*. Figure 4 shows the breakdown of open data activities funding.

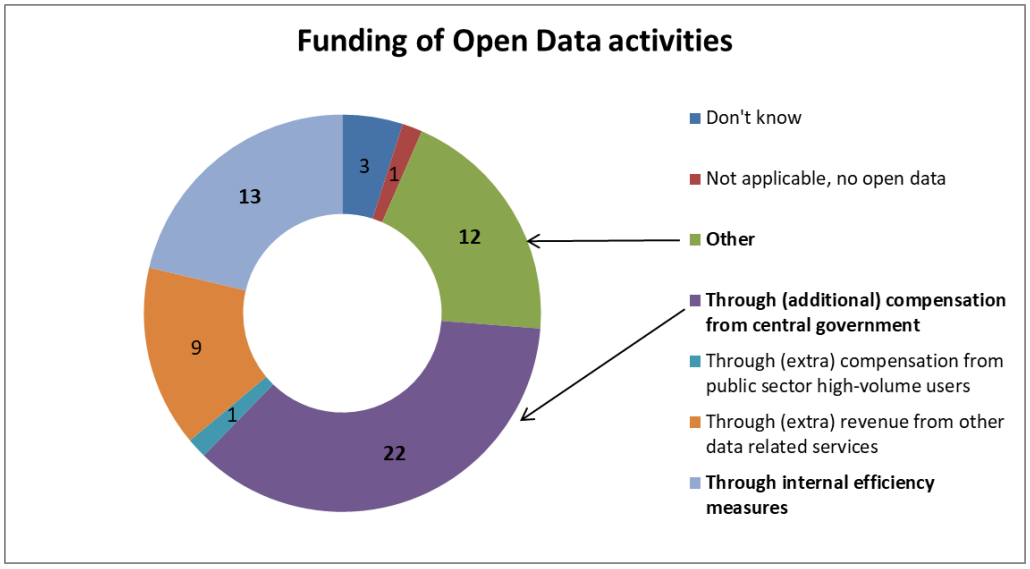


Figure 4: Funding of open data activities

3.2.5 Formal embedding of open data policies and licence

We asked the organisations to list in which way they have formally embedded open data policies within the organisation. Respondents could select more than an one option. The majority (18) said that they follow the national open data policy without adaptation whilst 14 organisations (39% of the responses) indicated that they have their own specific open data policy. A focus on the 14 organisations who answered *'the open data directive is not yet transposed in [their] country'* revealed that, 8 of them follow their own version or partially follow national open policy, 6 others follow national policy without application. We gave the respondents the possibility to give 'further information' in an open cell:

- *'*[We] *had a remit to recover costs. As a result we developed, with government, a policy to meet this requirement and also supply open products.'*
- *'Programme of Prime Minister (…) (2019) stated "A strategy and an action plan will be prepared for opening up and utilising public sector data, taking into account the impact of data protection regulations and any legislative needs. The aim will be that public sector organisations will open interfaces unless there is a special reason for not doing so." '*
- *'Based on the national open data policy we adapted our own geoinformation legislation'*
- *'The Open Data Directive EU 2019/1024 is the basis for regulating open data. In addition, each Land decides on matters where the competence is assigned to the Land and not to the Federal Government (…)'*
- *'We try to open as many datasets as possible. At the moment there are about 80 datasets (including web services) opened (…)'*
- *'we were pioners to the national policy'*

Figure 5 shows the distribution of organisations following national open data policies.

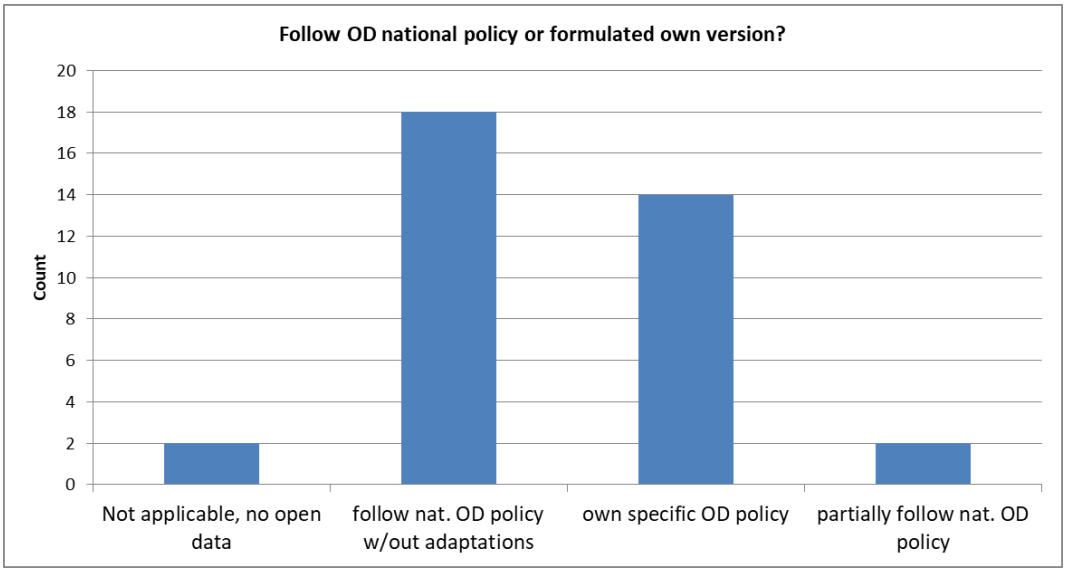


Figure 5: Adherence to national open data policy

In addition, we asked which open data licence(s) were used to supply open data. With this question, we wanted to assess which organisations adhere to the recommendations made in 2014[2] by the European Commission to use Creative Commons licences for the supply of open government data (recommendation that the European Commission applies to itself in 2019 with the Commission decision of 22.2.2019 adopting Creative Commons as an open licence under the European Commission's reuse policy[3]), even if the upcoming implementing acts[4], announced in the Open data directive (Directive (EU) 2019/1024), could have produced a "stand-by effect" since 2019.

A huge majority (89%) of the respondents are using Creative Commons licences whilst only two organisations are using other licences exclusively. The respondents could give 'further information' in an open cell:

- '[We have] *developed* [our] *own licencing conditions that are more restrictive than national open data licence (…)'*
- *'Creative Commons licences are used only partially; the "Deutschland Lizenz" is shorter and easier.'*

Figure 6 shows the type of open data licences in use by the organisations.

[2] Guidelines on recommended standard licences, datasets and charging for the reuse of documents (2014/C 240/01) – European Commission

[3] Cf. https://digital-strategy.ec.europa.eu/en/news/rules-reuse-commission-information

[4] Cf. Article 14.1 *"The Commission shall adopt implementing acts laying down a list of specific high-value datasets* (…)*.Those implementing acts may specify the arrangements for the publication and re-use of high-value datasets. Such arrangements shall be compatible with open standard licences."*

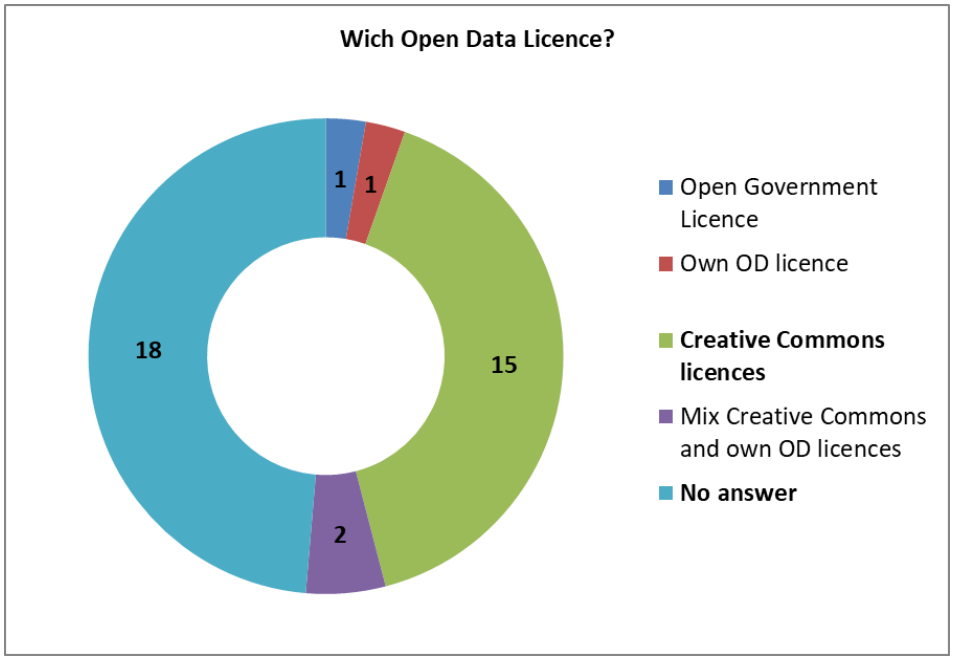


Figure 6: Open data licence in use

3.2.6 Measure taken to ensure sustainable open data

In this questionnaire we interpreted sustainability from a technical perspective, i.e supply of open data and metadata in open data standards, and if tools / platforms were supplied to facilitate users. We also asked if NMCAs provide data as linked open data. In addition, we interpreted sustainability from a financial perspective, i.e. if sufficient financial and human resources were (re)allocation to ensure open data supply in the long term. We then studied sustainability from an organisational point of view, i.e. has the organisations appointed special data and to champion the cause of open data. Finally, we asked if the organisations participated in platforms / forums with other open data suppliers and with open data users and if they encourage feedback from the citizen to improve the data (crowd sourced data). The organisations could select more than one option.

Almost all organisations have taken multiple measures to ensure that open data will be available in a sustainable way (each organisation gave in average 3.8 means). The TOP 3 of the responses were related to standards and facilitating users: *'we supply open data in open standards'* (27 quotations), *'we supply metadata in open format'* (27) and *'we supply data tools / platform to facilitate users'* (22).

The respondents could give 'other means' in an open cell:

- *'We supply some data as LOD'*
- *'At the beginning we ran Open Data Masterclasses. We initiated* [a program] to *support start-ups using open data'*
- *'We developed the collaborative aspect of our data production with national and local actors of the geospatial community (community sourcing). We participate in hackathons, with our data and with developers who can participate in projects. We have set up* [an] *incubator whose objective is to help the small private companies in their innovation project whenever they use our data.'*

Figure 7 shows the frequency of measures taken to ensure sustainable open data.

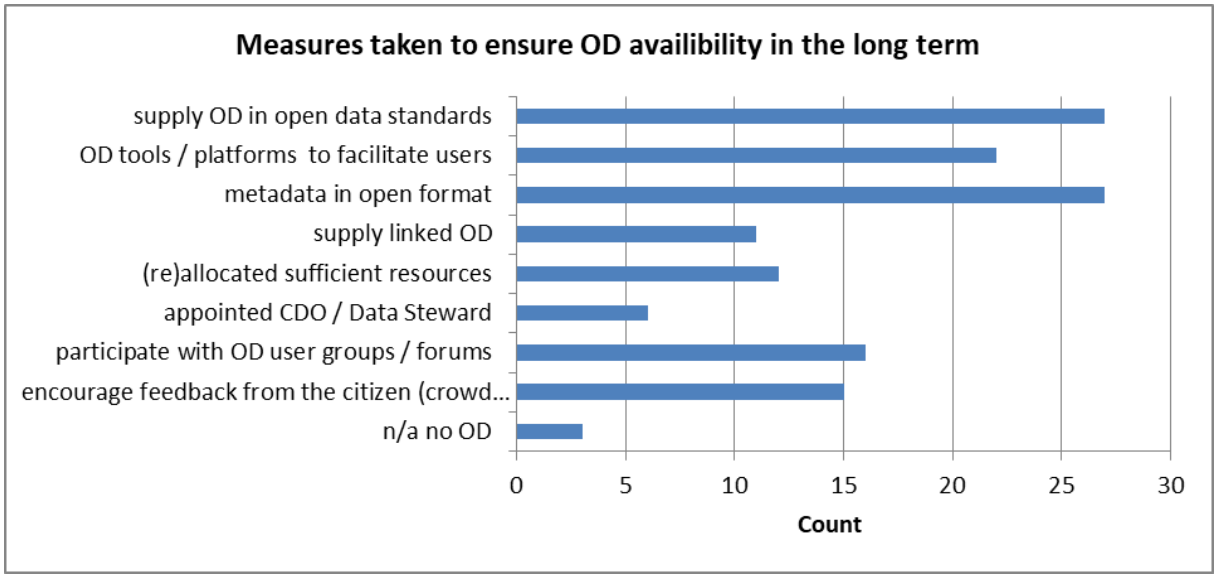


Figure 7: Measures taken to ensure sustainable open data

3.2.7 Motivations for implementing open data within the organisation

This question allowed the NMCAs to select and rate motivations of open data on a Likert scale with 5 different choices (unique): *'Not important at all'*, *'Not very important'*, *'Neutral'*, *'Somewhat important'*, *'Very important'*. A sixth possibility was *'Unknown'*.

The TOP 3 of the most important drivers for supplying open data appear to be legal requirements (22 quotations), leading to more economic growth due to companies producing value-added products and services (21) and leading to more societal benefits (16). Leading to higher efficiency / lower transaction costs for other organisations (14) and leading to higher data quality (through feedback, etc.) (14) are also considered as very important or somewhat important.

The respondents could give 'other motivations' in an open cell:

- *'Open data lead to increased use in research and education fields.'*

Figure 8 shows the motivations for supplying open data, and the importance of these motivations for the organisation.

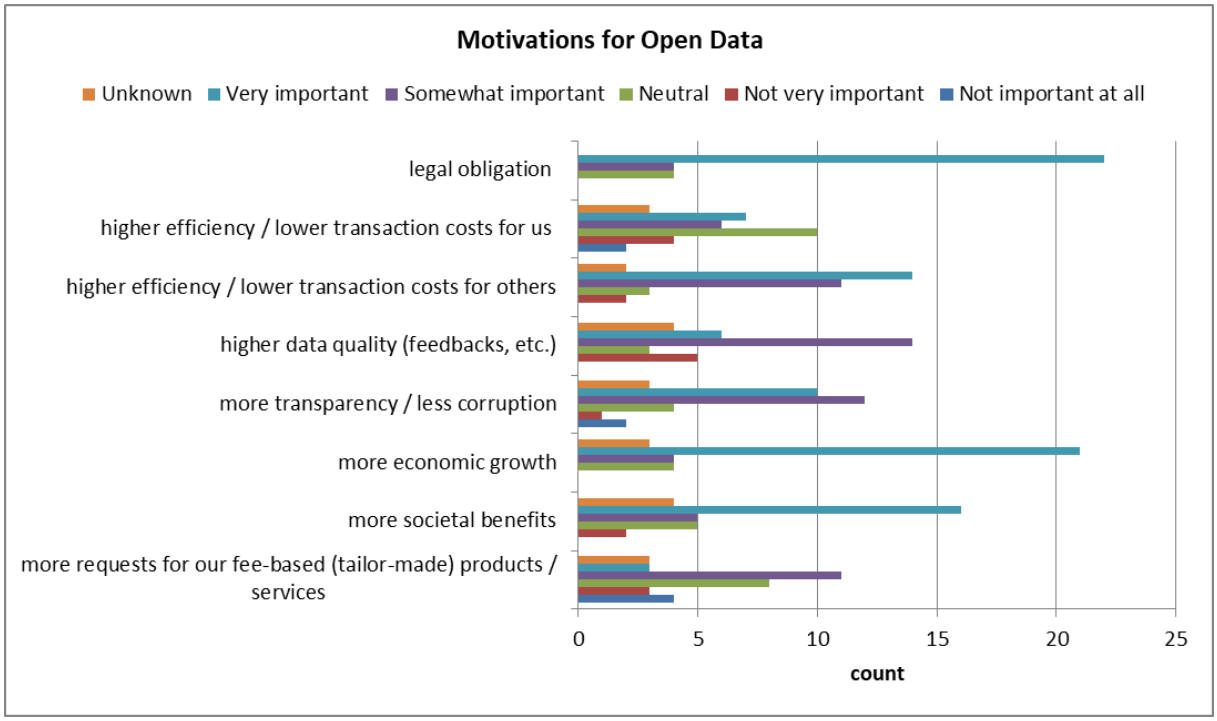


Figure 8: Motivations for open data with ranking of importance to organisation

3.2.8 Open data maturity within the organisation

In this question, we asked how organisations would assess the level of maturity for open data within their organisation. The organisation could select which phase they consider to be in, ranging from *'Pilot phase: open data is a new concept, and not part of our organisation's culture'* to *'Open data are not only institutionalised within our organisation, our organisation is also considered to be a leader in the open data field / a role model for other organisations'*. Organisations could only select one option.

The organisation that selected the option *'Other, namely'* indicated that it *'depends on the Local Mapping and Cadastral Agencies, ranging from pilot phase to part of the organisation's culture'*. Open data is institutionalised in the majority of the organisations (55%), and 8 of them considered that they play a role model in their country. Only 3 organisations indicated that they are in a starting phase (pilot or project).

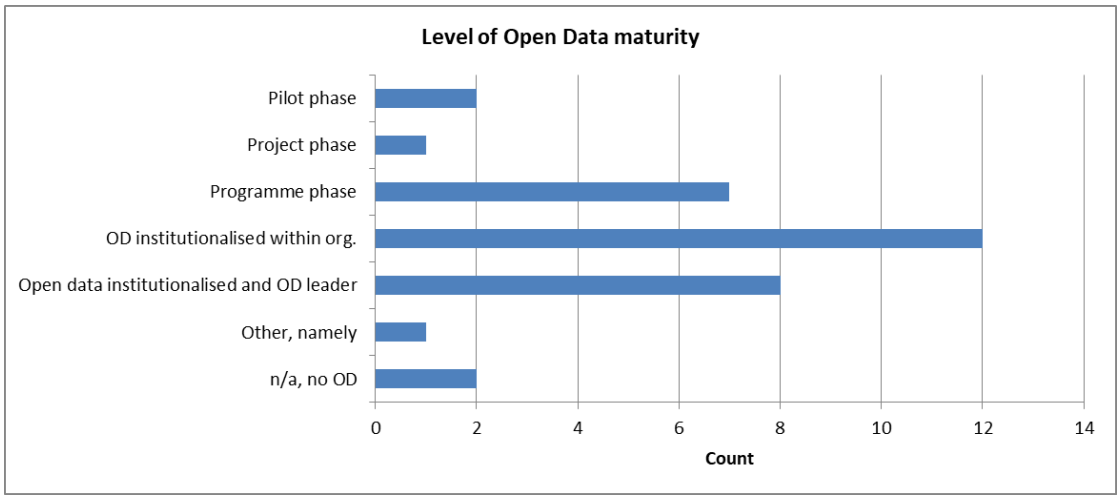


Figure 9: Level of open data maturity of the organisation

3.2.9 Effects of open data for the organisation

The last multiple choice question was related to the effects of open data on the organisation. Organisations could select more than one option. Examples of such effects are extra infrastructure investments, e.g. extra security measures and/or server capacity to host open data separately from the fee-based data. Other effects may be that the organisation receives more questions related to technical aspects of the data and feedback / error reports by users. Not all users are equally capable to use the data when provided in (open) geo standards and not all metadata is clear to the users. Open data may also lead to more requests for other (non-open) datasets (as fee-based services) or for tailor-made products as re-users see the potential of open data and prefer a higher service level for the same dataset. In addition, other public sector organisations may ask for advice on open data implementation.

The organisations quoted in average 3.2 effects. The TOP 3 of the most frequent effects given by the organisations is: *'We receive(d) more questions related to technical aspects of the data (how to use the data, data formats, etc.)'* (quoted 20 times); *'We have to employ extra server capacity due to increased data traffic'* (19); *'We receive(d) more feedback related to data quality (error reports, etc.)'* (14). 6 organisations answered that they have *'no noticeable effects, open data are only a small part of* [their] *services'*.

The respondents could give 'other effects' in an open cell:

- *'There has been no significant effects. There was an increase in our spatial data users.'*
- *'We received less direct feedback from users and we were not able to contact them to enquire what they were using the data for and any issues.'*
- *'We receive more requests from partners for collaborative productions.'*

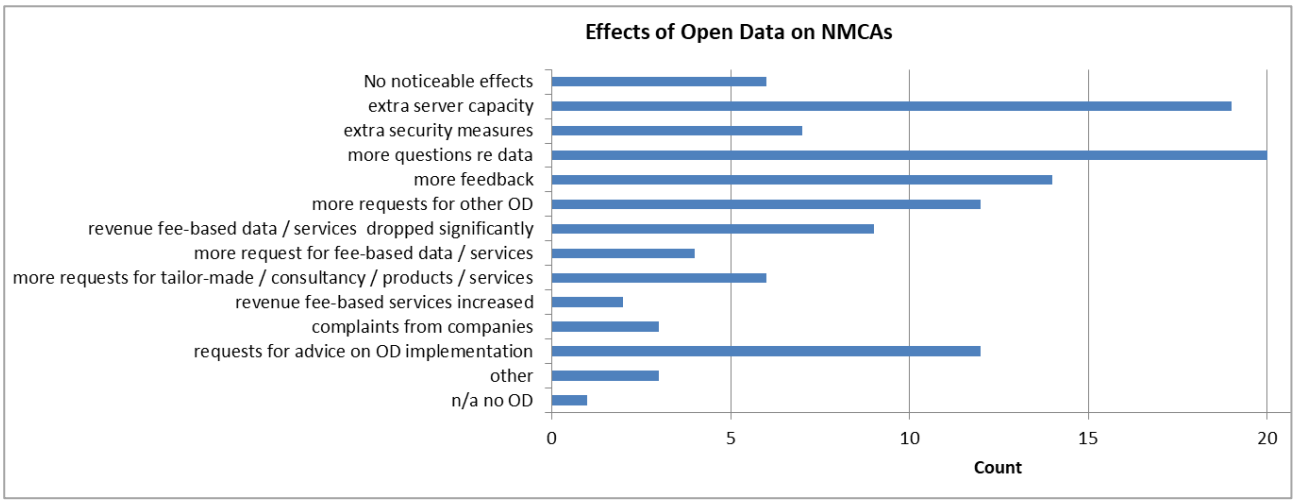


Figure 10: Effects of open data on the organisation

3.2.10 Future vision for open data

The last section of the questionnaire consisted of three open questions related to the respondents' vision on the future of open data, both within their organisation and within their country. In addition, we asked which success factor will in their opinion contribute the most to a sustainable open data environment.

3.2.10.1 Vision on the future of open data within the organisation

A huge majority of respondents (80%) indicated that open data will increase within their organisations in the future, from an improvement of the current situation to full open data. Below some extractions of these responses:

- *'All data collected by our institution will be open in order to support economic development.'*
- '[Our organisation] *has an long term open data vision that states that data should be open, easy accessible and usable'*
- *'Our vision is to make all the data open for all users, based on Directive INSPIRE.'*
- *'Full implementation of the Open Data Directive, which will change our funding model'*
- *'All geodata from* [our organisation] *will be open and free of use and free of charge'*
- *'Our organisation is committed to broad data access for all. In the future,* [our organisation] *plans to open more datasets. All data collected in central geodetic and cartographic resource will be free of charge and available using services and new tools.'*
- *'Taking into account the potential economic and social benefits,* [our organisation] *is determined to open the data of the registers and information systems it processes (...)'*
- *'We want to make even more datasets available'*
- *'Open data is here to stay and is part of regular business. We expect a continuous growth in data supply.'*
- *'We would like to open as many topographic datasets as possible and all suitable (non-personal, non-sensitive) cadastral data in the future.'*

Two respondents said that open data should increase in the future, with uncertainty:

- *'We will continue to make data available on open licence when it is possible to do so while not impacting negatively on* [our] *business model.'*
- *'Nowadays, our data are open and it will continue in the future. But, some challenges should be faced (sustainability, better users knowledge, ...)'*

Only two others see more uncertainty for the future:

- *'Depending on available budget between stepchild and well organised process'*
- *'Open data will have to be more widely provided by my organization, for legal reasons, but the consequences in terms of revenue and technical challenges still need to be addressed (start-up phase)'*

Figure 11 shows the vision on the future of open data within the organisation.

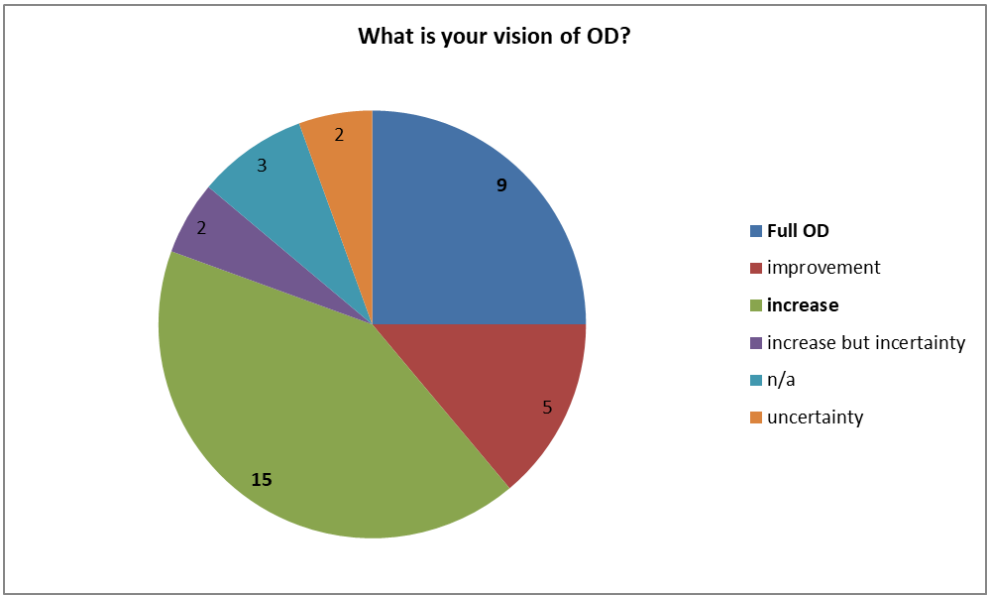


Figure 11: Vision on the future of open data within the organisation

3.2.10.2 Vision on the future of open data with the country

A majority of respondents (64%) saw an increase or an improvement of open data in their country.

Among the answers given:

- *'Both supply and use of open data will increase.'*
- *'Most of the data collected by the state administration will become open. The restriction will remain on sensitive data considering protection of persons and sensitive infrastructure.'*
- *'Open data is probably inevitable to address future national challenges as for example climate changes, planning and emergencies/crices.'*
- *'At mid and long term, the number of open dataset is going to grow more and more.'*
- *'In* [our country], *the number of available Open Datasets is still growing and we forecast that it will continue to grow in the future.'*
- *'Open data is an essential prerequisite for the development of new technologies, as well as a significant incentive for the private sector to create new, high-quality and innovative services.'*
- *'The sharing of open data should allow better coordination and facilitate the exchange of geodata between the different administrative levels in* [our country]*'.*
- *'Despite the fact that for the last years* [our country] *made a huge progress in implementation of the open data initiatives and data policy in general, there is still a big gap in the forming of the data policy on national level and general "data culture".'*

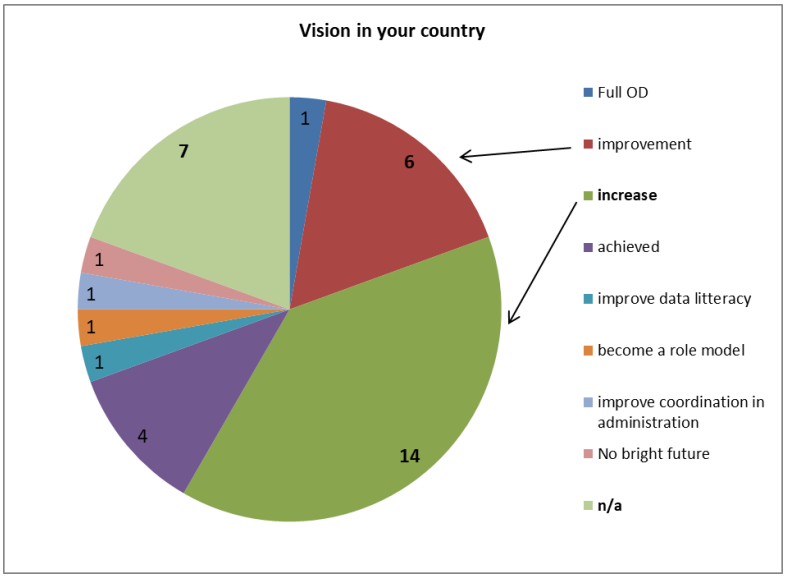
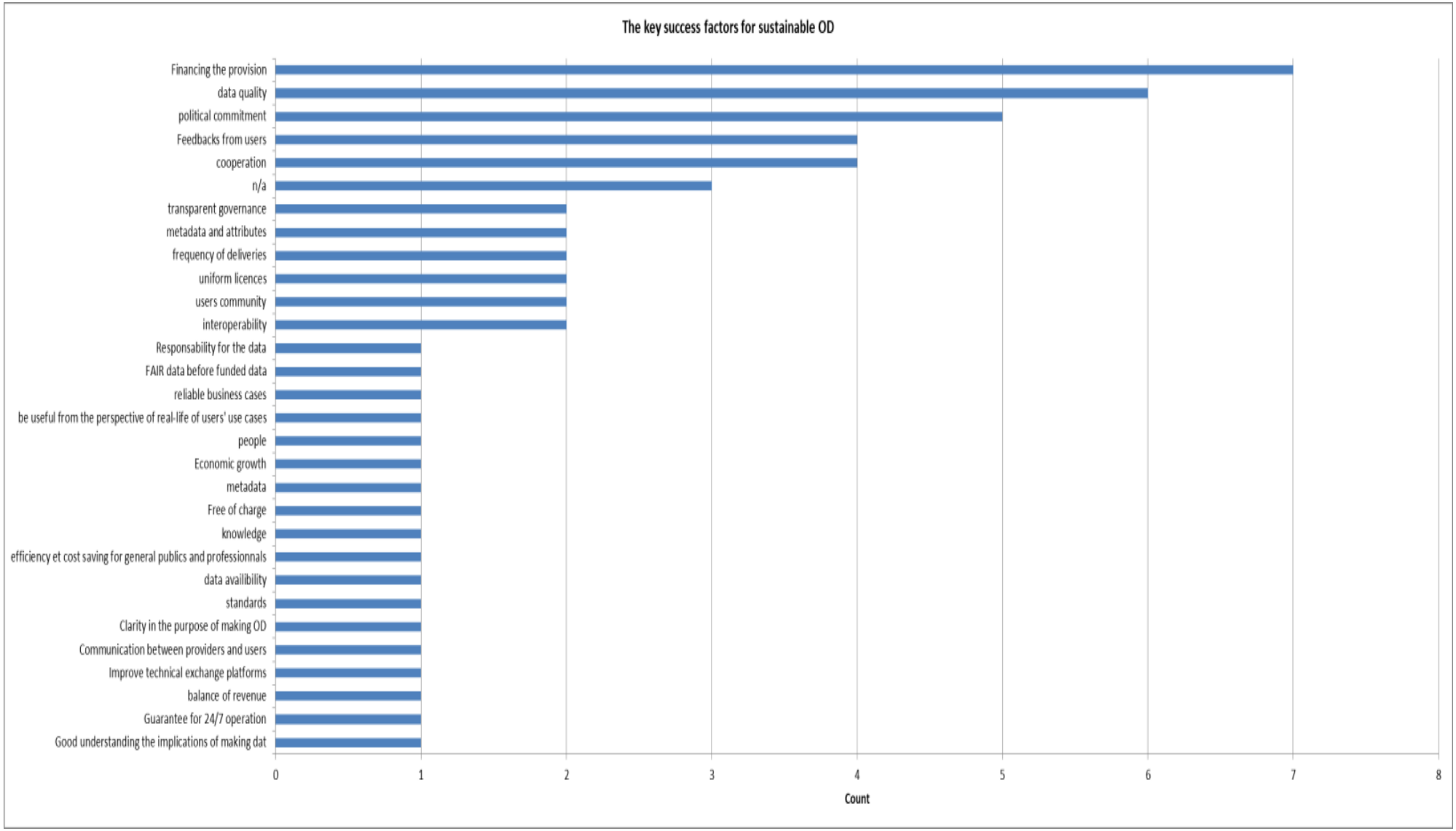


Figure 12: Vision on the future of open data with the country

3.2.11 Success factors that will contribute to sustainable open data

The TOP 5 of the success factors that will contribute to sustainable open data are:

- Financing the provision (quoted 7 times)
- Data quality (6)
- Political commitment (5)
- Feedbacks from users (4)
- Cooperation between producers (4)


The key success factors for sustainable OD
Financing the provision
data quality
political commitment
Feedbacks from users
cooperation
n/a
transparent governance
metadata and attributes
frequency of deliveries
uniform licences
users community
interoperability
Responsability for the data
FAIR data before funded data
reliable business cases
be useful from the perspective of real-life of users' use cases
people
Economic growth
metadata
Free of charge
knowledge
efficiency et cost saving for general publics and professionnals
data availibility
standards
Clarity in the purpose of making OD
Communication between providers and users
Improve technical exchange platforms
balance of revenue
Guarantee for 24/7 operation
Good understanding the implications of making dat
0
1
2
3
4
5
6
7
8
Count

4 Preliminary conclusion and further steps

The outcomes of the survey appear to confirm the dynamic shift towards open data adaptation by NMCAs, maybe under the positive stimulation of regulations for some of them, especially for countries which are members of the European Union. The Directive (EU) 2019/1024 of the European Parliament and of the Council of 20 June 2019 on open data and the re-use of public sector information provides (article 14) that publications and re-use of specific high-value datasets such as geospatial or earth observation and environment (annex 1) shall be free of charge from mid-2023 onwards. The European commission is pushing for the OD directive transposition[5], despite that there numerous legal uncertainties. However, many NMCAs are engaged in Open Data even if the EU directive is not transposed yet in their country.

Open Data is here to stay, more than ever but not without sustainable (co)fundings (additional compensation from central government is currently the main way to finance open data). More cooperation between stakeholders (data suppliers, public sector members, users…) matters and is seen by NMCAs as another important key success factor for building a sustainable open data ecosystem.

So, (public) fundings allowing availability, and dissemination of up-to-date quality data, and living links with communities of co-suppliers and users are currently seen as the best viaticum by NMCAs.

To conclude, here are three points that could be deepened, as further steps of this survey:

- Check in a few months the impact on the open data path of NMCAs of the oncoming publication application acts of the European "Open Data" Directive;
- Assuming that Open Data is unavoidable for NMCAs, take a step back by studying "open data ecosystems";
- And, take another step back by studying NMCAs business models in general to see trends in their way of operating (which activities they did and they no longer do or do in another way, which current activities they did not do before, etc.).

[5] *The Commission calls on 19 Member States to comply with EU rules on open data and the reuse of public sector information* (from Daily News 30/09/2021: https://ec.europa.eu/commission/presscorner/detail/en/mex_21_4962)

Annex: EuroGeographics EuroSDR Open Data Survey October 2021

EuroSDR / EuroGeographics Open Data Survey October 2021

Introduction

Switching to an open data policy may pose a challenge to the business model of National Mapping & Cadastral Agencies (NMCAs), especially if they are required to generate revenues to cover a substantial part of their operating costs. This survey, which is a joint operation between EuroGeographics and EuroSDR, aims to assess the effects of open data policies on the business models of NMCAs and which changes have been made to cope with revenue losses due to open data supply. It's objective is to also identify trends as a repetition of research led in 2017 by EuroSDR and TU Delft.

By completing this survey you are agreeing for the data to be shared between EuroGeographics and EuroSDR. The deadline for completion is 8th November 2021.

* 1. What is the name of your organisation?

* 2. What is your function with the organisation?

3. In which country is your organisation located?

* 4. From which year does your organisation supply open data? (Please select one answer only)

- ◯ Before 2010
- ◯ Before 2014
- ◯ Before 2017
- ◯ 2018
- ◯ 2019
- ◯ 2020
- ◯ 2021
- ◯ We have no open data at all ◯
- Do not know

* 5. Is the open data directive (EU n° 2019/ 1024) transposed in your country?

- ◯ Yes
- ◯ No, not yet
- ◯ This is not applicable in my country ◯
- Don't know

If yes, please give the reference to the national legislation.

* 6. Please list the names of the open datasets of your organisation. If more than 5, please list the 5 main open datasets, preferably in order of popularity

Most popular	
2nd most popular	
3rd most popular	
4th most popular	
5th most popular	
Don't Know	

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Funding of organisations

Could you please give an indication of the breakdown (in percentages as an integer) of the way in which your organisation is funded, both before the introduction of open data and after open data? Please make sure the percentages add up to 100%

* 7. Central government funding from general revenue

Before open data	
After open data	
Don't know	

* 8. Specific taxation

Before open data	
After open data	
Don't know	

* 9. Registration fees, e.g. cadastral registration fees

Before open data	
After open data	
Don't know	

* 10. Fee-based data supply

Before open data	
After open data	
Don't know	

* 11. Fee-based services, e.g. made-to-order products, consultancy

Before open data	
After open data	
Don't know	

* 12. Other

Before open data	
After open data	
Unknown	

* 13. How does your organisation finance open data? (please selection multiple options if relevant)

- [ ] Through (additional) compensation from central government
- [ ] Through (extra) compensation from public sector high-volume users
- [ ] Through (extra) revenue from other data related services
- [ ] Through internal efficiency measures
- [ ] Don't know
- [ ] Not applicable, no open data

Other (please specify)

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* 14. In which way is the open data policy of your organisation formally embedded? (Please select all relevant options)

- [ ] We follow the general open data policy formulated on national level without adaptations
- [ ] We do not follow the open data formulated on national level at all as our organisation is exempt from this policy / falls into exceptional category
- [ ] We partially follow the open data policy formulated on national level, even though our organisation is exempt from this policy / falls into an exceptional category.
- [ ] We formulated our organisation's open data policy to suit our specific requirements
- [ ] For our open data, we use Creative Commons licence(s) / declarations
- [ ] Do not know
- [ ] Not applicable, no open data

Please give further information here (e.g. Differences between national open data policy an dthat of your organistion, specific requirements of your organisation's open data policy, license information.....

* 15. Which measures have your organisation taken to ensure the (long-term) technical, financial and/or organisational sustainability of open data? (Please select all relevant options)

- [ ] We supply data in open data standards
- [ ] We supply data tools / platform to facilitate users
- [ ] We supply metadata in open format
- [ ] We supply our data as linked (open) data
- [ ] We have (re)allocated sufficient financial / human resources to maintain data quality (updates etc.)
- [ ] We have appointed a (Chief) Data Officer / (Open) Data Steward(s) to champion open data and assist employees
- [ ] We participate in platforms / forums with other (open) data providers
- [ ] We participate in open data user groups / forums
- [ ] We encourage feedback from the citizen to improve the data (crowd sourced data)
- [ ] Do not know
- [ ] Not applicable, no open data

Other measures, namely..

* 16. What are the reasons/ motivations for open data within your organisation? Please, indicate the level of importance

	Not important at all	Not very important	Neutral	Somewhat important	Very important	Unknown
We have a legal obligation						
Open data (will) lead to higher efficiency / lower transaction costs within our organisation						
Open data (will) lead to higher efficiency / lower transaction costs for other organisations						
Open data (will) lead to higher data quality (through feedback, etc.)						
Open data (will) lead to more transparency / accountability / less corruption						
Open data (will) lead to more economic growth due to companies producing value-added products and services						
Open data (will) lead to more societal benefits						
Open data (will) lead to more requests for our fee-based products and services / tailor-made products						

Other (please specify)

* 17. How would you assess the level of open data maturity of your organisation?

*

- ◯ Pilot phase: open data is a new concept, and not part of our organisation's culture
- ◯ Project phase: our organisation is willing to experiment with open data but continuation of project will depend on success of the project
- ◯ Programme phase: organisation sees the advantages of open data but there are still questions / issues to be addressed
- ◯ Open data are institutionalised within the organisation and has become part of the organisation's culture
- ◯ Open data are not only institutionalised within our organisation, our organisation is also considered to be a leader in the open data field / a role model for other organisations
- ◯ Do not know
- ◯ Other (please specify)

- ◯ Not applicable, no open data. If not applicable, please skip the next question

* 18. What effects has open data supply had on your organisation? (Please select all relevant options)

- ☐ No noticeable effects, open data are only a small part of our services
- ☐ We have to employ extra server capacity due to increased data traffic
- ☐ We have to employ extra security measures to safeguard our other non-open datasets
- ☐ We receive(d) more questions related to technical aspects of the data (how to use the data, data formats, etc.)
- ☐ We receive(d) more feedback related to data quality (error reports, etc.)
- ☐ We receive(d) more requests for additional datasets
- ☐ Our revenue out of fee-based data / services has dropped significantly
- ☐ We receive(d) more request for fee-based data / services (with Service Level Agreements, higher level of detail, etc.)
- ☐ We receive(d) more requests for tailor-made / consultancy products and services
- ☐ Our revenue of fee-based services has increased
- ☐ We receive(d) complaints from companies (e.g. claiming unfair trading practices)
- ☐ We received requests from other organisations for advice on open data implementation
- ☐ Not applicable, no open data

Other (please specify)

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* 19. What is your vision on the future of open data in your organisation?

* 20. What is your vision on the future of open data in your country?

* 21. In your opinion, what are the key success factor(s) that have or will contribute the most to a sustainable open data ecosystem?

* 22. Please use this box to provide an additional comments and/or information to your answers, if needed.

23. If you are happy for us to contact you, please leave your e-mail address

Thank you for your time. The results of this survey will provide input for a workshop on Sustainable Open Data Business Models for NMCAs scheduled for early February 2022 (02/01 and 02/02). This workshop will bring together the NMCAs to present and share their experiences of open data and discuss the survey results with representatives of academia and industry, and will be jointly hosted by EuroGeographics and EuroSDR.