OPEN ELECTION DATA: EVIDENCE FROM CROATIA IN A COMPARATIVE PERSPECTIVE*

Petra Đurman[1, **], Dario Nikić Čakar[2] and Davor Boban[2]

[1]University of Zagreb, Faculty of Law
 Zagreb, Croatia

[2]University of Zagreb, Faculty of Political Science
 Zagreb, Croatia

ABSTRACT

This article explores the concept of open election data, as a specific type of institutional open data. Transparency of electoral procedures, as the most fundamental democratic process, is crucial for the legitimacy of democratic political systems. By providing detailed information on electoral processes in open formats for the re-use of the general public, open election data provide an additional democratic dimension for contemporary democracies. The aim of this article is to assess the state of open election data comparatively and in Croatia. The analytical findings suggest that the availability of open election data in most of the countries included is rather limited in scope, with significant cross-national and within-country variations. Numerous countries make only election results, political party and candidate registration lists and polling station information available in open formats, while other types of election data cannot be accessed in machine-readable forms.

KEY WORDS

CLASSIFICATION

INTRODUCTION

Open data are one of the most salient developments in e-government and e-participation. The availability of data to everyone in an open and machine-readable form, free of charge, represents a specific mechanism for achieving government transparency, which goes much further in accomplishing the values of open government than traditional transparency, which refers to the accessibility of information, regardless of its form. The re-use of open data for commercial or non-commercial purposes also promotes participatory government, because users (i.e. the public – individuals, NGOs, private businesses, media, academia, etc.) constitute a critical element in generating the final outcome of the data (re)use, including different applications, sophisticated business product based on open data (e.g. legal information portals, business portals) and scientific research and analyses.

The potential benefits of different categories of open data have already been well documented in the literature [1, 2]. Different types of institutional and political data – such as data on state organisations and public sector authorities, their functioning, election data and similar – are particularly important for the democratic legitimacy of politico-administrative system. Because the transparency principle represents a *conditio sine qua non* for the democratic electoral process, information on different aspects of electoral organisations and processes – such as data on election and referendum results, campaign financing, electoral management bodies or voter lists – constitute a crucial element for providing the legitimacy and citizens' trust in politico-democratic processes. Accurate, complete and good quality open election data (OED) can enhance electoral integrity and accountability by providing detailed information on electoral processes not only to selected stakeholders, but also to the public in general, enabling them to make informed decisions[1] [3-5]. In addition, primary users of OED such as journalists and scientists can reuse the data for scientific and professional analyses, predictions, interpretations and similar.

This article represents an exploratory study with a purpose of assessing the state of OED in Croatia, from a comparative and national-specific perspective. To do so, we first elaborate OED as a specific type of institutional open data, after which we consider the theoretical relevance of election data for contemporary political systems. In the methodological part of the article, Croatia is compared to other EU member states and the UK with respect to the main OED indicators, followed by in-depth analysis of OED ecosystem in Croatia, including the regulatory framework, types of OED available, features of the portal/website, data provider and users. The applied research method included desk research and content analyses of Internet documents, portals and official websites.

OED AS A TYPE OF INSTITUTIONAL OPEN DATA

Although there is no single, unanimously accepted categorisation of open data types, they do not significantly differ. As identified in one of the earlier categorisations, the main types of open data include business, geographic, legal, meteorological, transport and social data[2] [7; p.14]. Within the category of social data – which includes different statistical data, such as economic, employment, health and population – specific types of institutional and political/public administration data can be extracted. These encompass data on different organisational and functional aspects of politico-administrative organisations and other public sector authorities at different levels of government (state, local, regional). This includes data on electoral processes, public officials, public sector bodies (e.g. lists of public sector authorities, register of national minorities' councils) and their functioning (e.g. schedule of government meetings). The openness of this type of data is particularly relevant for strengthening the procedural legitimacy of politico-administrative systems.

In general, electoral process in a democracy refers to all procedures and activities related to legally defined appointment of public officials and public bodies by voters. Electoral process, therefore, consists of procedures conducted before, during and after election day. The basic sources of election information are legal acts and other official documents regulating elections[3]. They primarily include information on the type of elections (e.g. parliamentary, presidential, local, European), the type of electoral system and its characteristics, constituencies, candidates, electoral lists, judicial and constitutional court decisions on elections and provisional and final results. Although a normative framework that contains electoral law as well as judicial practice does not represent electoral data in a narrower sense, they can be publicly available in open formats and in an easy searchable way via specialised portals or official websites. Therefore, the electoral framework is considered a component of electoral data [3, 8]. Election data include re-usable information on the pre-election process (campaign financing, voter and candidate registration, polling stations), the election process itself (e-voting and counting, voter lists) and the results of the election process and post-election actions (publishing results, complaints). We refer to OED only when they are published in an open, machine-readable format[4].

Election data are, in general, collected (and provided) by the central (state) organisations which organise and conduct the elections (Electoral Management Boards – EMBs, Central Election Commission or similar management bodies). In some countries, civil society associations have taken the role of data providers, in addition to their role as data users and mediators[5] [3; p.210]. Election data can be published on the official websites of EMBs, open data portals or third-party websites/portals, as in the case of election databases published by international organisations/associations. Primary users include scientists, media, journalists, electoral observers and agencies, who produce electoral predictions, analyses, explanations and interpretations of electoral processes and results based on OED. A secondary user of OED is the general public, whose use of the data is not in-depth, but rather related to information, education and socialisation, as such data facilitate familiarisation with the organisation, implementation and results of democratic procedures. The role of the public is, however, particularly emphasised in the context of OED. Namely, alongside being open data users in the 'outcome' dimension of the electoral process, citizens are involved as participants – active (candidates) and/or passive (voters) – during the elections as the most fundamental democratic process. Privacy issues are, in general, not very problematic in the case of election results, due to secret ballot for voters and public political candidacy. However, it is an issue of considerable concern in the case of voter registration and, especially, the e-voting process[6].

Principles for OED do not differ from the standards of open data in general. According to the Open Election Data Initiative, election data are open when they are: (i) timely (available as quickly as necessary for it to be useful); (ii) granular (primary, raw data which are not in an aggregate or modified form); (iii) available for free on the Internet (available without any monetary restrictions and easy to locate); (iv) complete and in bulk (all data are contained in a file so that the entire dataset can be obtained in one download); (v) analysable (available in digital, machine-readable form); (vi) non-proprietary (open, non-restrictive formats over which no entity has exclusive control – e.g. CSV, XML and JSON)[7]; (vii) non-discriminatory (available to any individual or organisation without limitations based on user identity; anonymous access to the data); (viii) license-free (open for re-use and redistribution for any purpose)[8]; and (ix) permanently available (permanent URL, portal or online archive) [13].

In practice, some serious limitations can be found when it comes to the type, availability and quality of OED. First, OED are often reduced to election results. Data related to voter registration and election results are the most common type of election data published, while information on political/electoral financing is more rarely available. Second, election results,

as well as other types of election data, are not always published in open formats. Publishing election results as images instead of open file formats impedes their re-use and diminishes their democratic potential. Varying formats for official results also represent a barrier for their usability [3; p.210, & p.213, 4; p.8]. Third, whether published in machine-readable formats or not, the comprehensiveness and consistency of election data are always an important issue. Inconsistent retention of records is therefore an important obstacle for the openness of election data. With respect to all mentioned aspects, the existing literature points at significant variations, not only between different countries, but also within them.

THE RELEVANCE OF OED FOR POLITICAL SYSTEMS

Over the last two decades, the principles of government transparency and openness have become inherent concepts of contemporary governance and decision-making processes. They represent political values, referring to the availability of different government information to the public (transparency) and the possibility for the public to provide feedback information to the government (openness) [14]. Growing requests for government 'opening' towards the public can be attributed to recent developments and doctrines in public administration, such as good governance, which has been strongly advocated by international organisations (e.g. OECD, United Nations, European Union). However, government secrecy is always perceived by the public as suspicious [15], even if the government functions regularly and efficiently. Proactive provision of different government data to the public, on the other hand, implies there is nothing to hide. It enables the public to hold government officials accountable, thereby promoting citizens' trust and the legitimacy of politico-administrative institutions and actors. Transparency is primarily achieved via right-to-know regulation and its instruments, such as open meetings, media reports, publishing documents, registers and databases [14, 16, 17].

The importance of election data, as a type of institutional data, stems from the elemental importance of the election process in a democratic political system. The transparency of election results, the data on financing political campaign, the composition of electoral management bodies and similar information represents a necessary precondition for the public to be motivated to participate in election processes. Availability of such information in open formats, containing comprehensive and accurate data, provides additional democratic value as well as practical benefits for the government and the public. On the one hand, it widens the circle of potential open data users, because detailed election information is not reserved for selected stakeholders only (such as important media), but is available to the general public, including civil society organisations, journalists, election observers, scientists and individuals in general [3; p.210]. As a result, the general public can better understand the election process, which has effects on procedural legitimacy, and make informed decisions, which concerns the outcome legitimacy. On the other hand, media, journalists and scientists – who represent the primary users of OED – are enabled to reuse the data for scientific and professional analyses, predictions and interpretations, which can produce very practical benefits. For instance, analyses based on OED can reveal interesting findings, factor interrelations or shortcomings of the election process (such as the quality across districts regarding population size, manipulation of electoral district boundaries and the like), which can then be useful input for policymakers to improve existing regulation and/or practices.

COMPARATIVE ANALYSIS

Although discussion of the benefits of OED has been gaining salience, 'relatively little election data is published according to open-data principles' [3; p.213]. Regarding the type of data,

election results are the most commonly published OED, with other types of election data being less commonly publicly available, especially data on political and electoral financing. Some technical deficiencies of OED include the duration of data availability, the granularity of available data, restrictive licensing, non-machine-readable data formats and registration and authentication requirements for data users [3; p.213]. In methodological terms, cross-national comparisons of different OED are burdened by language barriers, because the name of the dataset is usually officially available in the native language only. Different databases, mostly published by academia and scientific organisations, contain comparative OED and are very useful, although most often reduced to election results.

The Open Election Data Initiative lists 16 categories of election data that can be published as open data, covering all activities of the electoral process in the pre-election period, moving to the election day and ending in the post-election period [3; pp.212-213]. In this part, we selected seven key categories which represent the core of the democratic election process and applied them to the analysis of availability of OED in 27 EU member states plus the UK[9] (see Table 1). We opted for the EU case-selection framework mostly because it represents the most comprehensive open data legislative initiative and also because of the high democratic standards to which its member states must adhere.

To analyse the availability of OED in the EU context, we focused our investigation primarily on two sources – the open data portals of EU member states and the official websites of national electoral management bodies. By doing so, we aimed to explore not only the impact of 'external' factors (EU legislation) on opening election data in an individual member state, but also the 'internal', country-specific state of the art when it comes to the question of availability of election data in open formats. Election data classified as open is published in formats such as CSV, JSON and XML, while data available in PDF, JPG and similar formats was not categorized as open. We also limited the scope of the analysis to only parliamentary elections in each country, mostly because the state-wide general elections to the representative bodies are seen as first-order elections, while other levels of election are seen as of less importance (local, regional, European).

Table 1 shows that, in general, the availability of OED in most of the countries included in the analysis is rather limited in scope. A large number of countries make only election results, political party and candidate registration lists and polling station information available in open formats. The availability of other categories of election data in open format is rather scarce, especially those relating to voter lists (access to detailed information about eligible voters), election campaigns (availability of timetables for campaigns) and electoral complaints (number of complaints and the outcomes of conflict resolution). In eight countries, election data are not published in any open format, but are rather available in other online forms which are not machine-readable.

There is also no consistency with regard to platforms where OED are published. In most cases, OED can be accessed on the official websites of electoral management bodies, while a smaller portion of election data, particularly election results, is downloadable from national open data portals. It is also possible to find OED on other websites as well, which implies that OED are scattered around the Internet instead of being kept available in timely and permanently manner at one central spot. In some instances, it took great effort to trace the final location where OED are published.

When turning attention away from general cross-national observations to the country-level perspective, we can report several cases of good practice, among which Lithuania, Romania and United Kingdom stand out. This is particularly true for Lithuania, with its Central Electoral Commission publishing a large variety of election data in machine-readable formats.

Table 1. Open election data in 27 EU member states and in the UK.

	Election results	Pol. party/ candidate registration	Campaign finance	Election campaigns	Voter lists	Polling stations	Electoral complaints
Austria	*						
Belgium							
Bulgaria	*/**					*/**	
Croatia	*/**		**			**	
Cyprus							
Czech Republic	*	*				*	
Denmark	**						
Estonia	*/**					*/**	
Finland	**	**					
France							
Germany	*/**	**				*	
Greece							
Hungary	*						
Ireland	*	*					
Italy	**						
Latvia	*/**	*/**				*	
Lithuania	**	**	**			**	**
Luxembourg							
Malta							
Netherlands	*/**	*					
Poland	**	**				**	
Portugal	*/**						
Romania	**	**	**			**	
Slovakia	*/**	**					
Slovenia	**						
Spain							
Sweden	*/**						
United Kingdom	**	**	**			**	

Remark: empty cells refer to no open data.

*Open Data Portal

**Electoral Administration

Data on election results, voter registration, candidates and the financing of political campaigns are systematically organised, easily searchable and accessible and cover the whole period since the introduction of Lithuanian democracy in 1990. On the other hand, there are also several cases of bad practice in publishing OED. For instance, Ireland and Austria have published results of some parliamentary elections which are not complete and in bulk. It is possible to find the results of the Austrian 2019 parliamentary elections at the open data portal, but only for the region of Upper Austria and not for the rest of the country. Furthermore, there are also cases like Spain and Portugal, which have a significant amount of election data available at the official websites of central election management bodies, but it can be downloaded only as PDF documents.

From a comparative perspective, it is important to notice that new democracies in Central and Eastern Europe (CEE) are apparently doing much better in terms of the 'openness' of election data than their 'older' counterparts in Western Europe. Table 1 shows that democratic latecomers in CEE such as Lithuania, Romania, Latvia, Poland and Croatia have OED available on a much larger scale than well-established democracies like France, Belgium and Luxembourg, without any OED published, or Austria, Denmark, and Sweden, with only election results published in open formats. This observation is somewhat puzzling when taking into consideration the differences in the level of politico-economic and democratic development between these two groups of countries, so further research should be conducted to provide a plausible explanation for these differences.

Finally, cross-national comparison of OED is indeed overburdened by language barriers, because native language versions of websites and published data are the norm. There were only few cases in our research for which fully functional English version of websites and data are available, which makes comparison difficult. On the other hand, there are several election databases containing different election results in open formats from numerous countries and these are a valuable source of OED for cross-national comparisons. For instance, The European Election and Referendum Database [18] provides election results on a regional level for European countries and publishes the results of parliamentary elections, EP elections, presidential elections and EU-related referendums for 35 European countries. The Constituency-Level Elections Archive (CLEA) [19] offers a dataset with detailed election results at the constituency level for lower and upper chamber legislative elections from around 170 countries. The Global Elections Database [20] provides data on the results of national and subnational elections around the world, with data available in various open formats. The ParlGov project [21] covers 37 EU and OECD democracies, offering data on about 1700 parties, 1000 elections and 1600 cabinets, with election results available in machine-readable files. The Political Data Yearbook [22] is published on behalf of the European Consortium of Political Research and covers 'election results, national referendum, changes in government, and institutional reforms for a range of countries, within and beyond the EU'. Data are available in CSV and XLSX formats.

OED IN CROATIA

The previous comparative analysis shows that Croatia is doing very well in comparison to other European countries, regardless of whether they are new democracies in CEE or well-established democracies in the West. In this section, we take a bird-eye snapshot of OED in Croatia, exploring other components of OED alongside indicators compared in the previous section. We provide more detailed description of available types of OED in Croatia, including their quality and providers, as well as legal framework. In addition to these 'provision' elements, we assess the 'outcome' dimension of OED as well, i.e. the users of OED[10]. These elements are commonly referred as wider environment of open data, i.e. open data ecosystem [1] and represent areas or sub-areas of indicators within different assessment frameworks (e.g. in Open Data Maturity Report, policy dimension – encompassing countries' open data policies and strategies, impact dimension - referring to open data re-use, government policies and government action within readiness in Open Data Barometer). For the purpose of this analysis, we rely on Open Data Maturity Report results as a general referential benchmark, although these findings encompass open data in general, not a specific category such as OED[11].

In Croatia, systemic regulation for open data is in place within the Law on the Right to Access Information [24], which transposes the PSI Directive (as it is the case with other EU member states who had to transpose the Open Data Directive into their national laws) (see [25]), postulating that each public body must ensure that the data are published on the internet and that is easily findable

and machine-readable. In addition, a formal Open Data Policy (Politika otvorenih podataka) was adopted in 2018 by the Croatian Government as a strategic direction for further development of public administration openness, although without adopting a strategy or action plan for implementing the policy. According to the Open Data Maturity Report in policy dimension, Croatian score is slightly above the EU average – 87 %. Specific regulations referring to OED can also be found – the reports on campaign financing have to be published in open and machine-readable formats on the official website of Croatian EMB, in accordance with the Law on financing political activities, electoral campaigns and referendum [26]. Other electoral regulations do not refer to the openness of electoral data.

The types of available OED include election and referendum results, financing of political activities and campaign financing and the list of polling stations. The most extensive category is certainly election and referendum results, which encompass open data on presidential elections, parliamentary elections, elections for the European Parliament (EP), local elections, elections for national minorities' councils and representatives and data on the referenda (national, local and consultative). National election data comprise data from 2000 onwards (presidential elections are held every five years and parliamentary elections every four years); local elections data are available from 2013 (local elections take place every four years), as well as are European elections data (first elections for the European MPs held in 2013). Referendum data include data on two national referendums held in 2012 and 2013, the first one on Croatian EU membership and second one on the constitutional definition of the marriage.

The owner and provider of OED is the State Electoral Commission (Državno izborno povjerenstvo – DIP), which publishes data on election results on its official website, data on election campaign financing and regular financing of political activities and the list of polling stations [27]. Election results in open formats can be found on the national Open Data Portal [28] as well. All election data available on the Portal as well as on the DIP website are accessible without registration and free of charge. As in the case of many other types of open data in Croatia, a nation-specific open license is applied, which is substantially equivalent to the CC-BY license. OED are easily findable through a general Google search and orderly structured on the DIP website, while the Open Data Portal is easy searchable by filtering the type of data/publisher.

Regarding data quality, election results available on the DIP official website and Open Data Portal are available in CSV and excel file formats, financial reports on political activities and campaign financing are available in PDF and JSON, while the list of polling stations can be downloaded in an excel file format. Regarding content, general elections results are consistent since the 2000, albeit with some deficiencies related to the count of spoiled votes and individual vote counts for the representatives of national minorities. The data on constituencies are not available in open file format, while the data on polling stations are in open format but not integrated (available by constituency). Voter registration information is not publicly available. Because election datasets are static, uploading is not very frequent. The quality of metadata is one of the weak points of available OED, with metadata missing on the official DIP website and very scarce description of the election results datasets on the Open Data Portal. Feedback options include sending an email to the data provider via official website and an option to indicate an error and provide suggestion via the Open Data Portal.

There are three main types of primary users of OED in Croatia. First, there are journalists, media and public opinion agencies who interpret and present the data to the wider public via different media channels and whose activities are mostly concentrated within the timeframe of a specific election. Second, there are scientists and researchers (mostly political scientists), who permanently use election data for scientific research and analyses. Third, different types

of NGOs use OED for their own analysis and policy papers, which are further used for policy advocacy purposes or the education of the general public. For instance, the NGO GONG regularly publishes various guides and manuals in the field of electoral politics, but is also focused on civic education with regard to citizens' electoral rights and understanding of electoral processes [29]. For European elections in 2019 and local elections in 2021, in cooperation with agency which provides IT support for the Croatian public sector, DIP launched applications for tracing election results and for monitoring the functioning of polling station committees.

Although Croatia scores high on Portal usage according to the latest Open Data Maturity Report (130/160), OED do not seem to be attractive type of open data for individual users. Statistics on the use of datasets is not published on the OD Portal nor on the DIP official website, but we can assume that such usage is rather low. The results of a survey conducted within the TODO project at the Faculty of Law, University of Zagreb, revealed a very low level of faculty employees' familiarisation with the concept and benefits of different types of open data and, considering the rather small academic community, we can assume that the same applies for political scientists as well.

CONCLUSION

Despite numerous social advantages and the positive impact on citizens' trust, education and overall legitimacy of the politico-administrative system, the potential of OED has not yet been accomplished in most of the countries [3]. The observation of Yang et al. [30], that OED is largely an emerging area, remains valid. On the one hand, some of the front-running countries in open data in general, such as Austria and Spain, are lagging behind when it comes to the 'opening' of election data, while open data 'followers', such as Romania and Croatia, are doing much better in providing OED. On the other hand, there are countries like Spain and Portugal that publish very extensive amounts of election data, but not in an open format. For researchers, this implies the necessity for further research on such discrepancies between the countries, while for practitioners (providers), it calls for more systemic opening of election data. However, the problem may be in the 'demand' side of the sub-ecosystem; OED appear not to be as attractive for individual users as geospatial, meteorological and some other institutional data or data concerning current policy issues/problems (such as data on the COVID-19 pandemic). The level and impetuses of election data re-use (and open data re-use in general) in Croatia should be investigated in further research.

From a comparative perspective, Croatia is among the countries that have made significant strides in making election data available in machine-readable formats. A good practice in publishing comprehensive electoral results on behalf of DIP is recognised as an example of increasing transparency and accountability in the 2021 Open Data Maturity Report. Still, more types of election data could be published in an open format (e.g. candidate registrations, election campaigns, electoral complaints) and the quality of existing metadata could be improved. However, in a number of OED categories, Croatia scored better than a significant number of other countries usually identified as front-runners in general open data initiatives or are seen as 'old' democracies that are much more inclined to transparency practices (e.g. France, Spain).

Finally, we also argue that the significant differences observed between new democracies in CEE and old democracies in western and southern Europe could also pave the way for further research on OED. For instance, one could explore the factors behind the higher levels of availability of OED in emerging democracies in the post-communist world. Can these differences be explained by the process of accession of these countries to the EU and the

fostering of the EU conditionality policy? Are there any region-specific factors that have made CEE countries the frontrunners in opening election data? One possible explanation might be that this is a result of infrastructure development (i.e. older democracies already had long-term structures in place for handling election data, while newer democracies did not, which made it possible for them to start from a greater level of openness). These are puzzling research questions that require special attention in future research.

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[1]The Open Data Maturity Report for 2021 stated that 'an increase in the impact of open data on transparency and accountability was observed, where 74% of the Member States define the impact as high, 11 % as medium, and 7 % as a low' [6].

[2]This categorisation is in accordance with the list of priority areas for open data as identified by the European Commission (Directive 2003/98/EC of the European Parliament and of the Council of 17 November 2003 on the re-use of public sector information; repealed in 2019 by the Directive 2019/1024 on open data and the re-use of public sector information). The list of thematic categories for high-value datasets, as referred to in Article 13(1) of the Directive, includes geospatial, earth observation and environmental, meteorological, statistics, companies and company ownership and mobility data.

[3]The most important sources of electoral law are the constitution and electoral laws. The constitution of a country generally states only the most important electoral principles, such as that suffrage is universal and equal and that elections are secret and mostly direct, the age at which active and passive suffrage is acquired for a particular type of election and elected state or supranational authorities. Sometimes the electoral principle according to which elections must be conducted can be included in the constitution (e.g. the proportional principle in the Czech constitution), and in some cases a specific type of electoral system can be constitutionalised as well (e.g. individual transferable voting in the Irish constitution). However, most electoral matters are left to the legislator to regulate by individual laws, which often have the status of organic laws (i.e. a qualified majority of votes is needed for their adoption in the parliament). Electoral law is usually not regulated by single, but rather by several acts (as is the case in Croatia).

[4]This, in general, applies to democracies where elections are free and fair. For non-democratic countries – that is, those with totalitarian, authoritarian, hybrid and other undemocratic regimes where elections are not free and fair, or at least unfair – election data probably do not reflect the actual will of the citizens expressed in the elections, but are often fabricated in favour of regime candidates or electoral lists. Therefore, to analyse the election system and election data in a particular country, it is necessary to consider the type of political regime as well as the history of elections, before drawing conclusions on the credibility of election data.

[5]An example is the non-profit project *OpenElections* which, during the 2018 general elections in the United States, converted and published official precinct-level election results in an open format. Until then, great variations between the states existed and under half of the states had election results in usable formats [4].

[6]On e-voting see [9, 10].

[7]XLS and DOC file formats are, for example, proprietary formats owned by Microsoft. PDF was previously also a proprietary format, until Adobe released PDF as an open, non-proprietary standard in 2008 [10].

[8]Regarding licenses, there is considerable difference between the United States, where the licensing for election data is not seen as necessary nor desirable, in accordance with the understanding that government data are free as they are produced within the public domain, and European countries, where licenses are commonly used by the government to make the data available for everyone [12].

[9]We decided to include the UK as well, since it only recently left the EU.

[10]With regard to the reuse of OED, we rely on basic insights based on desk research and available benchmarks, since more systemic research should be conducted in that respect.

[11]According to the Open Data Maturity Report for 2021, Croatia has been placed within the category of 'followers' (scoring 74–86 %), alongside with Finland, Sweden, Greece, Bulgaria, Latvia, Romania and Czech Republic. In relation to the previous year, this represents a decrease in open data maturity level, when Croatia's score was ranked within the category of 'fast-trackers' [6]. More on open data in Croatia in [23].

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