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**LEVERAGING THE POTENTIAL OF OPEN DATA IN UKRAINE
TO ENHANCE TRANSPARENCY AND ACCOUNTABILITY OF
STATE GOVERNANCE**

Master's thesis

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**ARUANDEKOHUSTUSE JA LÄBIPAISTVUSE PARENDAMINE
UKRAINA AVALIKUS VALITSEMISES KASUTADES AVATUD
ANDMEBAASE**

Magistritöö

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Author's declaration of originality

I hereby certify that I am the sole author of this thesis. All the used materials, references to the literature and the work of others have been referred to. This thesis has not been presented for examination anywhere else.

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Abstract

In the digital era we are living in, data is a key factor for transformation of public services and governance into more transparent ones. Problems like corruption have no place in the modern world anymore. The current situation in Ukraine makes clear, why it is urgent to look into this subject.

The thesis aims at investigating interrelations between open government data and corruption, in particular, the potential of this data to reduce the level of corruption and to stimulate the creation of public services. In order to achieve a better understanding of the core problem and feasible solutions, theoretical approaches of good governance along with transparency and accountability have been analyzed. Open government data can be defined as a tool to ensure transparency and accountability of governance and, therefore, decrease corruption. In terms of this research, the author has conducted a state-of-the-art analysis of Ukraine's state and experts' interviews in this field. Such in-depth analysis allowed for the validation of the hypothesis that open government data eradicates corrupt behaviour and, most important supported it with actual evidence. Ukraine is a real example of an efficient use of open data for the creation of data-driven public services and anticorruption tools.

As an outcome of this research, practical recommendations on further improvements and advancements designated for the government have been developed.

This thesis is written in English and is 61 pages long, including 6 chapters, 2 figures and 3 tables.

Annotatsioon

Käesoleval digitaalsel ajastul on andmed võtmefaktoriks muutmaks avalikud teenused ning valitsemine jätkusuutlikuks. Probleemil nagu korruptsioon ei ole enam kohta modernses maailmas. Ukraina praegune olukord selgitab kui kiireloomuline on seda teemat uurida.

Antud lõputöö eesmärgiks on uurida vastastikuseid suhteid avatud valitsuse andmete ja korruptsiooni vahel, seal hulgas uurides andmete potentsiaali vähendada korruptsioonitaset ning stimuleerida avalike teenuste loomist. Saamaks paremat arusaama peamisest probleemist ja võimalikest lahendustest, analüüsiti teoreetilisi lähenemisi seoses hea valitsemise ning läbipaistvuse ja vastutusega. Avatud valitsuse andmeid saab defineerida kui tööriista, mis kindlustab läbipaistvuse ja vastutuse ning seeläbi vähendab korruptsiooni. Käesoleva uurimistöö raames on autor teinud analüüsi Ukraina näitel, viies läbi intervjuud antud valdkonna ekspertidega. Põhjalik analüüs andis võimaluse kinnitada hüpoteesi, mida toetatakse tegelike tõenditega, et avatud valitsuse andmed vähendavad korruptiivset käitumist. Ukraina on hea näide efektiivselt avatud andmete kasutamisest eesmärgiga luua andmepõhiseid avalike teenuseid ning korruptsioonivastaseid tööriistu.

Uurimistöö väljundina on loodud praktilised soovitused valitsusele edasisteks parendusteks ning edusammudeks.

Lõputöö on kirjutatud inglise keeles ning sisaldab teksti 61 leheküljel, 6 peatükki, 2 joonist, 3 tabelit.

List of abbreviations and terms

EU	European Union
NGOs	Non-government organizations
TIU	Transparency International Ukraine
TAPAS	Transparency and Accountability for Public Administration
UN	United Nations
ODC	The Open Data Charter
IT	Information Technologies
OGD	Open government data
OG	Open government

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1 Introduction

1.1 Relevance of the topic

The digital era we are living in makes us to reconsider our understanding of governance and ways of public services delivery. Tech-savvy generation expects governments to provide all the services online in an efficient and high-quality manner. Also, it may perhaps be observed how the role of data is changing within recent years and, moreover, how its importance increases in almost every field of our lives. As a consequence, more often, we are facing a term of “open data” - sets of available to everyone data, that can be reused without any limitations or restrictions [1]. Open data has become not only a trendy term but also a tendency of strategic development of a concept of an open or transparent state (e-government). A huge number of new and existing public services uses open data to create innovative solutions or improve already existing services, and this aspect distinguishes open data from other forms of information submission.

It is recognized across the globe that introduction of open government data can increase transparency, accountability of the government and enhance citizens' participation in governing activities. It is also acknowledged that OGD technologies have potential to facilitate effective functioning of government bodies, increase quality of public services, and lead to improved policy formulation by adding to decision-making process actual facts, data and more important - opinions of the citizens. Introduction of open data not only contributes to sustainable development and strengthens good governance, but also ensures the efficient use of public resources and reduces level of corruption. Citizens have actual evidence about performances of public bodies and can provide feedback to them with suggestions on improvements. It enables true democracy and adds value to public service provision.

1.2 Motivation of the thesis and research questions

Among the all benefits from open data exploitation, the most important one, in case of Ukraine, is its potential being a tool for fighting corruption. In Ukraine, the phenomenon of corruption is rooted into different spheres of public life. Additionally, it affects the overall development of the country. The elimination of corruption in Ukraine will lead to a rise in citizens' trust towards government and enhance accountability of public sector, which will simplify e-governance implementation. The current situation in the field of open data in Ukraine can be determined by a low level of government and business readiness and lack or low quality of key datasets. Unfortunately, open government data goals such as accountability of the government, use of official data in the decision-making processes, citizens' engagement into governance, development of socially useful services have not been completely achieved yet. Therefore, the main objectives of the thesis are:

- to explore the current state and tendencies of open data movement;
- to understand the potential of open data exploitation;
- to define how to improve open data movement in Ukraine aiming to incorporate it into anti-corruption strategy on the national level and build more socially-useful public services.

The literature review of theories and current practices allow to formulate the following research questions:

RQ1. What is the connection between open data and corruption?

RQ2. How does open government data contribute to the creation of public e-services in Ukraine?

RQ3. What are the main contributions of open data to anti-corruption strategy in Ukraine?

Main research questions make possible the conjecture of the thesis to evolve. The hypothesis statement is: Open data contributes to the process of suppression of corruption and public service creation. Answering research questions will support or oppose the hypothesis statement.

Hence, by outlining the theoretical background and the research methodology, the case of Ukraine will be described with further analysis and discussion of results that

were received during the conduct of interviews. It will be followed by presenting recommendations and specifying future work. Lastly, the thesis will be finished with an overall conclusion.

1.3 Outline of the work

To address research questions thesis begins with the theoretical background overview. The second chapter introduces the theory of good governance as a backbone of understanding what an efficient governance is and what its necessary attributes are. It is followed by an explanation of transparency and accountability as the main contributors of the good governance. In order to ensure transparency and accountability of the state, government information must be available for public which leads to the open government data concept. Afterwards, open data along with transparency and accountability is interpreted as tools to eliminate corruption. At the end of theoretical background chapter, interdependence of open data and corruption is explained together with an anticorruption open datasets table.

The third chapter describes research methodology employed by author to answer the main research questions. To specify, a case study and interviews have been chosen for this purpose. The author outlines main features of the case study methodology as well as the reasoning why especially this approach has been applied. In the interviews section author reports on the data collection method and selected open data experts as interviewees. As a summary of this chapter, limitations of the research methodology is presented.

The fourth chapter provides a review on the open data movement in Ukraine. The author accentuates the tendencies of the development and the biggest OGD projects that make a valuable contribution to the reduction of corruption level in Ukraine. Also this part includes information on availability of the anticorruption open datasets in Ukraine at this stage.

The interviews' analysis is given in the fifth chapter. It presents different ideas and arguments of Ukrainian experts as well as conflicting statements about exploitation of OGD in Ukraine. Based on the data received from the interviews, author formulates recommendations on how to improve the current situation. As a result of in-depth analysis, suggestions on the future work is proposed.

The last part is the conclusion. There, findings of the thesis are summarized and answers to research questions are provided.

2 Theoretical background

2.1 Good governance theory

An overwhelming role of technologies in the modern world is fostering innovation in every sphere of life, especially in the way to govern. More often, such terms as, “open data” and “open government” are used in the description of the democratic state. OG can be considered as a modernized approach to governance with the high involvement of the citizens to the process. Although understanding of governance has changed through time, the core meaning remains almost the same, even though academics have tried to interpret it in their own way.

In the research, Fukuyama (2013) characterizes governance as “government’s ability to make and enforce rules, and to deliver services, regardless of whether that government is democratic or not” [12]. However, definition of governance by itself is not enough in the contemporary world that is predisposed to constant striving for improvement. This has inclined authors to develop and polish a notion of “good governance”.

The concept of “good governance” has been relevant and discussed for centuries. Nevertheless, the definition of this term has been modified and adjusted in correspondence to challenges of the society at that time. Diverse interpretations were made not only due to the level of a progress of the specific state but cultural and behavioral differences of nation as a whole. Historical background has a significant impact on the understanding of nature of good governance. Nowadays, different international organisations and scholars are working on the thoroughgoing definition of the “good governance” and its components. Despite of slight differences of the opinions, the United Nations has made an attempt to summarize them by highlighting eight the most comprehensive characteristics. Therefore, good governance has to be [14]:

- participatory;
- consensus;
- oriented;
- accountable;
- transparent;
- responsive;
- effective and efficient;
- equitable and inclusive;
- follows the rule of law.

Good governance means that activities of public agencies and institutions produce results that meet the needs of society, while at the same time utilizing the most of their available resources. The United Nations states, that “accountability can be considered as a key requirement for good governance. Not only public institutions, but the private sector and civil society organizations should be accountable to the public. In general, organization or institution is responsible to those who will be affected by its decisions or actions” [14]. Accountability cannot be ensured without transparency and the supremacy of law. In its turn, transparency means that decisions and compliance are governed by specific rules and regulations. Furthermore, it guarantees openness, availability and accessibility of information to those affected by certain decisions and their implementation. Based on these criterias, it becomes more feasible to formulate objective evaluation of the “goodness” of the governance.

The need for a definition of “good governance” derives from necessity for guidance and recommendations on how to govern. Good governance concepts define main factors which have influence on the quality of governance, aiming to develop evidence-based policy (UNU-WIDER Working Paper No. 2012/30). Simultaneously, this notion tends to promote an idea of better governance that is based on the proposed set of values with the emphasize on its efficiency.

2.2 Understanding of transparency and its assessment

One of the fundamental component of the democratic society is the right to information that has been declared in Article 19 of the UN Universal Declaration of Human Rights (1948) [55]. This law became a backbone of the NGOs’ strategies which were forwarded to incorporate transparency into the activity of government institutions

to hold them “accountable in the glare of the public eye” [11]. Many academics emphasize on transparency and accountability to be seen as necessary prerequisite or a key for good governance. These two concepts have to be analyzed meticulously in order to define codependency between them and its contribution to good governance theory.

Transparency as a term can be defined in many different ways, depending on the sphere where it has been applied. In the academic paper, Maijer et al (2015) suggest to analyze transparency in governance within two interrelated realms: political and administrative [34]. Political realm is oriented on participatory democracy and state with supremacy of law [13]. Besides, he states that, “political transparency requires even fuller public disclosure by any organization - whether wealthy donor, lobbying group, political association, or corporation - that influences the political process” [13]. Availability of the data about governance activities motivates citizens to comprehend and get involved into the process. Apart from that, a question arises: whether to trust government or not.

According to authors a key question regarding the effect of transparency on the political affairs can be summarized as following: whether it strengthens or undermines constitutional democracies. To answer this question, Bovens et al. (2008) proposed three core aspects to be analyzed: democratic, constitutional and social learning perspective [5]. Democratic perspective aims to determine impact of the public information on citizens, is it adding value to them as to the valuable part of the democratic society. Transparency in this context has to empower development of civil society, encourage interest and participation of individuals in the public sphere as well as to enable them to monitor activities of political representatives. But, as a matter of a fact, citizens have a lack of competencies to comprehend all the data provided for them [30]. It leads to a conclusion that less likely citizens will utilize available to them information to make a well-thought political decision.

Constitutional perspective in terms of transparency focuses on institutional checks and balances. Maijer et al (2015) state that, “good governance arises from a dynamic equilibrium between the various powers within the state; transparency is needed to curtail the abuse of executive power” [34]. In this perspective connection between accountability and transparency is an influential factor. Citizens are granted monitorial ability that may lead to ambiguous result. A downside of this capability is a risk of misinterpretation of the politicians’ activities, resulting in skepticism and distrust.

Central idea of the social learning perspective is to evaluate contribution of transparency to the quality of democratic processes, such as debates or discussion, and ability to improve decision-making process within the group. One of the contribution is to facilitate “informed exchange of opinions” and reduce “information asymmetry” among the participants to assure fruitful debates [34]. A well-informed debates establish bilateral feedback between individuals and government that enables learning from each other.

Administrative realm is directly relevant to the managerial aspect of the theory of “good governance” [22]. Transparency usually seen as a tool to reduce corruption level and increase efficiency of the public service delivery. Nevertheless, administrative realm aims to answer when and how transparency contributes to “executive competence” of the public administration [34]. Three evaluation criterias of administrative realm are based on core administrative values proposed by Hood (1991): economy/efficiency, integrity and resilience perspective [21].

Economy/efficiency perspective in terms of transparency is addressed to answer: whether it accomplishes policy objectives and determines the most efficient ways of its realization. It is expected that “better information will result in more rational behavior” [34]. When citizens, before taking a decision, digest all the relevant information provided for them, it increases probability to make the most reasonable choice. Furthermore, transparency enhance quality of decision making in public sector, while adding third party- citizens to this process and, hence, giving them opportunity to observe and correct whenever its needed [33]. This sort of the citizens’ involvement grant an opportunity to the public sector officials to see things from another perspective, not only as service providers but also users.

The second, integrity perspective, attempts to answer whether resources and power of the government officials are used by appointment, leaving no place for nepotism or another way to abuse power. It can be said that transparency within this ambit may facilitate an exposure and prevention of corruption. As a limitation of the mentioned before, Park and Blenkinsopp (2011) emphasize, that even though transparency reveals corruption, public officials still have certain rights to privacy [38]. For instance, published government data will not expose who is corrupt and who is not, but provide a range of salaries and spending patterns of the civil servants letting citizens decide.

Whether transparency guarantees robustness and adaptiveness of the public sector systems to the upcoming challenges has to be evaluated within resilience perspective [34]. Many academic papers draw parallels between financial aspects and resilience perspective of an organization as two related concepts. In his work, Fung (2013) outlines, that transparency can manage the risks from the “harmful externalities” that appear as a result of activities of an organization [13]. When government information becomes public, third parties may get involved into the process and help to detect vulnerabilities or potential threats and, thus, motivate government agencies to develop resilience mechanisms.

The concept of government transparency remains hazy. Despite all the limitations and drawbacks, the advancement and new value it may add to the government activities are still predominant. In prior to radical implementations, government has to evaluate ways in which transparency can be produced and adjust it considering specification of a country. Transparency, together with enhanced participation and trust, has potential to result in efficient political change within a country [56].

2.3 Correlation between the concepts of transparency, accountability and open data in the governance

In light of what was written in 2.1 transparency and accountability can be seen as preconditions of good governance in any democratic state. Hood (2010) has made a definition of accountability as responsibility of an organization or public servant to feedback on their work related activities [20]. However, it can be considered challenging to define connection or relationship between transparency and accountability. Some authors predisposed to think that these two concepts have the same meaning, others that they are differs but highly interconnected and strengthen each other. Therefore, it is hard to agree on the certain idea regarding this dilemma although the results of the implementation of both notions are identic. In his work, Fox (2007) affirms, that “transparency is supposed to generate accountability” [11]. Nevertheless, transparency is not always produce the desired level of accountability. There are two different levels of transparency - clear and opaque [11]. Certainly, clear and opaque transparency results in the different application of governance accountability.

Fox (2007) explains that opaque transparency includes disclosure of information that is not related to the actual behavior of the government agencies and individuals who

work there [11]. Moreover, it does not answer the question of how these organizations take decisions or what is an outcome of their activities. On the other side, clear transparency disseminates information on the performance of government institutions, responsibilities of the public officials within an organization and an overview on the budget spendings (specifying expenditures of the budget of an organization). In general, clear transparency enables third parties such as NGO, politically active citizens and others who show interest to the public affairs to suggest critiques and opinions on the activities of the institutions that may be considered as objectionable. According to author, accountability can be divided on hard and soft. Hard accountability together with clear transparency, make it possible to impose or implement suggestions, sanctions or actions proposed by third parties (public). Fox (2007) summarizes the results of the connection between these two kinds of transparency and accountability as follows [11]:

- Both opaque and clear transparency result in dissemination and access to information;
- Combination of clear transparency and soft accountability leads to institutional “answerability”;
- Hard accountability results in implementation of sanctions, compensations or remediation.

Combination of clear transparency and soft accountability that is produced by public and civil society organizations entails formation of the most significant kind of answerability in terms of governance. Fox (2007) states that, “capacity to produce answers permits the construction of the right to accountability” [11]. Correspondingly, a conclusion may be drawn that availability of public information is not enough to guarantee full accountability of an institution by the time government agencies show willingness to initiate a dialog with the citizens.

Another point of view on the key to effective transparency is demonstrated by Heald (2012). He emphasizes on the role of the citizens (audience) to establish appropriate level of transparency and accountability. Furthermore, he stresses out that public has to be skillful and capable of making use of information provided through transparency mechanisms. Heald (2012) outlines public audit, as a related point to consider, which he sees “as “vital” to effective transparency by validating financial reporting, authorizing expenditure, and documenting performance and the absence of fraud and corruption” [19].

Similarly to the mentioned above Fox's (2007) classification of accountability, Schedler (1999) suggests his own: answerability and enforcement [11, 47]. By answerability, he understands the extent to which public officials are kept responsible for their activities. It means that public officials have to respond to the inquiries of the citizens without exception and in the proper manner. In terms of enforcement, author means that public officials not only accountable for their actions but can be punished in case of inappropriate behaviour. In this process citizens are delegated the right to decide about the rightfulness of the activities of public officials.

Notwithstanding the criticism that transparency and accountability can be seen as the same concept, introduction of transparency within the state does not guarantee answerability of the public bodies. As a matter of a fact good governance can be produced on condition that transparency and accountability are combined.

Considering the circumstances that were mentioned before, the relationship of good governance with transparency and accountability has to be analyzed. Foremost, transparency and accountability enable citizens' participation, prevent and decrease the level of corruption, eliminate nepotism, adding value to the public services and assure democratic rights within the state. As a prerequisite of these promising changes, all the public data sets have to be available online in the appropriate format, which leads to the introduction of such terms as "open data" and "open government".

Open data can be defined as public data that is published by governments, NGOs, organizations, researches and other institutions for public use with no restrictions regarding it further re-use [46]. It can be said that open data is a key or integral part of the transparency and accountability. Mayernik (2017) has developed a model which represents dependencies between transparency and accountability in different open data scenarios (See Fig.1) [32]. Each of the boxes suggest an expected outcomes after combination of one notion of transparency and one of accountability. The most positive results (marked with the dark blue) are expected whenever soft or hard accountability matches with clear transparency. It enables efficient information management as well as utilisation of the public data by citizens. Open data exploitation implies activity of viewing, analyzing, understanding or interpreting of the government datasets performed by a regular citizen or an organization [59]. One of the most significant quality of open data is answerability. When open data is not answerable that means nobody is asking for it, so redundant data is stored with no use. Consequently, open data is challenged to predict expectations of the potential users [32]. Government has to analyze and prepare

datasets that will be relevant and informative for the public. From one extreme to another, as a negative result from the combination of none, neither transparency nor accountability, the author sees “data gulag” (marked in the light blue). This term means storage of the large-scale data in the dark places that is used only by those who have access [32]. In this way, information cannot be available or bring any benefit to the citizens.

		Transparency		
		Clear	Opaque	None
Accountability	Hard	Data lifecycle management meeting all requirements	Putting data online with narrow descriptions	Losing funding due to data management
	Soft	Making data available, being answerable	Data may or may not be publicly available, minimal description and no responsiveness	
	None	Public archiving with no known user community		Data gulag

Figure 1. Dependencies between transparency and accountability in different open data scenarios. Source: [32].

In total, this model demonstrates the most evident outcomes when accountability and transparency are combined. It can be noticed how role of participation and data representation within the darker to light colored fields are decreasing, which leads to the realization of its importance as a key element. Without interest and participation of the public, open data can be considered as useless.

2.4 Modernization of a state with Open Data technologies

Respectively with the introduction of open data technologies in the governance, brand new concept appears - open government. The term “open government” has been introduced to the world in 2009 in the United States and the United Kingdom [13]. In his paper, Fung (2013) stresses the necessity to distinguish the difference between open government and information on-demand [13]. The former US President Barack Obama Administration’s Open Government Directive explains, that government agencies have to release public information proactively instead of waiting for the citizen’s inquiries. This directive indicates public data sets to be published in machine-readable formats, easy to be processed further by different software, etc. Furthermore, three core principles of the open government data have been defined by White House (2009): openness, participation and collaboration [52]. Kitchin (2014) summarizes that “through transparency, sharing and working together the value of data for society can be realized” [25]. The main purpose of OGD technologies is to democratize data and its production instead of establishing ownership of the government over it. Moreover, public sector information (PSI) has to meet specific set of requirements to be easy to use, interoperable, reliable and ready to be analyzed by special tools. Publication of OGD has to generate new knowledge and promote new government datasets to be released [25]. Experts of the open government data working group have proposed nine principles to be applied to the OGD that are recognized worldwide (see Table 1).

Most of these principles are related to the data format and quality. There is an extra need for data to be timely in order to preserve a sufficient value and relevance at the moment of request. All the criteria must be followed by the responsible authorities when they publish open dataset. An important problem to consider is difficulties with processing and converting data that has been collected years ago. Mostly government has to spend substantial amount of resources and time for accomplishing this particular task. Nevertheless, it cannot be avoided in order to guarantee flawless public service provision.

Table 1. OGD's principles of open data. Source: [28].

№	OGD principle	Explanation
1.	Data must be complete	All public data are made available. Data are electronically stored information or recordings, including but not limited to documents, databases, transcripts, and audio/visual recordings. Public data are data that are not subject to valid privacy, security or privilege limitations, as governed by other statutes.
2.	Data must be primary	Data are published as collected at the source, with the finest possible level of granularity, not in aggregate or modified forms.
3.	Data must be timely	Data are made available as quickly as necessary to preserve the value of the data.
4.	Data must be accessible	Data are available to the widest range of users for the widest range of purposes.
5.	Data must be machine-processable	Data are reasonably structured to allow automated processing of it.
6.	Access must be non-discriminatory	Data are available to anyone, with no requirement of registration.
7.	Data formats must be non-proprietary	Data are available in a format over which no entity has exclusive control.
8.	Data must be licence-free	Data are not subject to any copyright, patent, trademark or trade secret regulation. Reasonable privacy, security and privilege restrictions may be allowed as governed by other statutes.
9.	Compliance must be reviewable	A contact person must be designated to respond to people trying to use the data and to respond to complaints about violations of the principles. An administrative or judicial court must have the jurisdiction to review whether the agency has applied these principles appropriately.

Mentioned above 9 principles of OGD define open data more as a product than as a service. As a counterargument, Gurstein (2011) indicates that open data has to be viewed as a service process, which involves the relationship between government

agencies (data suppliers) and citizens (end-users) [15]. He suggests that process of the data opening has to be more service-oriented and meet expectations of the citizens. Hence, government has to develop different approach to the data management and release that potentially can influence public administration processes.

2.4.1 From open data to open government. Changing value of the public services

Open government data initiatives are developing tools for “fostering the public’s effective use of government data” [54]. It is expected that all the government data published by public agencies in the form of open data is easier to reuse, compare, analyze, process and interpret. There is an importance for government to get a feedback from citizens regarding quality, availability and relevance of information they publish online in order to facilitate further improvements in the way to govern and provide public services. Open data technologies in governance enhance higher collaboration among public agencies, private sector, society and NGOs. In frames of this collaboration public sector transforms into the new, transparent, accountable and cultivating innovations environment with the higher level of citizens’ engagement. Newly established environment has fostering conditions for creation of citizen-centric public services. Therefore, state capable to define and satisfy needs of the citizens and, moreover, reach better government-to-citizens relationships that is an essential part of better public services provision.

Ubaldi (2013) emphasis, that “open government data initiatives are creating an architecture for participation that enables users to not only be passive consumers of content and services, but also active contributors and designers in their own right” [54]. Individuals are getting involved into the process of governance since open data results in increasing value of their opinions. Opening government data empowers potential of citizens to make a competent and knowledgeable decision. They have access to unlimited government information what enables critical judgment of a service or other activity and motivation to provide suggestions to authorities on how to improve it. On the one hand, it can leads to increased number of enquiries and suggestions that will be difficult for government to address in efficient and timely manner. On the other hand, it will decrease significantly number of routine inquiries made due to lack of information provided online. Besides, civil servants while processing requests will find needed information faster and easier. Subsequently, it will cause reduction of time spend on each request, paperwork and transitional costs [54].

As it has been already mentioned before, opening of the governmental data leads to the establishment of the open government. Evans and Campos (2012) describe the open government as “the leveraging of information technologies to generate participatory, collaborative dialogue between policymakers and citizens” [10]. Open government implementation model consists of the four main stages: data transparency, open participation, open collaboration and ubiquitous engagement [29]. The first stage requires identification of high-value or high-impact data for the public together with the quality evaluation of the data in terms of its accuracy, consistency, and timeliness. Lee & Kwak (2011) agree that quality of the data is highly important because public information of the poor quality can lead to citizens’ misunderstanding or misinterpretation of the government activities [29]. Ideally, open government datasets have to improve quality of the citizens’ life as well as to empower them to make better decisions.

The second stage aims to enhance citizens’ participation. Authors specify that at this stage government has to welcome and utilize publics’ ideas and knowledge. Since citizens are users of the public services, they can suggest solutions on how to improve or innovate service provision. Bonabeau (2009) characterizes this process as collective intelligence when citizens assist government to make an informed and considerable decisions [4]. The only task of the public institutions at this stage is to respond to the feedbacks of the individuals.

The third stage is open collaboration among government agencies, citizens and private sector (G2G, G2C, G2B). Open collaboration refers to co-working of the government together with citizens and private sector on the specific task in order to produce common output. It may include policy-making, response to the emergencies and innovation of products or services. Lee & Kwak (2011) emphasize that open collaboration produces synergistic effect for all of the involved parties. In addition, it increases quality of the public services and policies [29].

The fourth stage is when transparency, participation, and collaboration come up on the new, more advanced level. It implies easier and more interactive public engagement through different means of communication (smartphones, computers, applications, etc.). This stage requires government to optimize all their applications and websites in order to make them more interoperable with the other platforms. Simultaneously, citizens are able to navigate across different government portals and participate in the activities initiated by public agencies while being logged in once only. Effective government

system is a result of all these advancements. Government agencies together with the citizens and private sector “form and nurture a sustainable ecosystem” [29]. Such system stimulates innovation and learning of the society. Transparency and openness of the government is becoming a standard and only then goals of the open government are fully realized.

As another point to consider, Pereira et al. (2016) outlines, that “public sector is characterized by a complex value structure, we understand that public organizations need a cost-effective and legally, to balance transparency and accountability, equal treatment to all citizens and users of services” [39]. Therefore, public organisations can achieve it with increased democratic participation of civil society and private sector in the public administration. Harrison et al. (2012) suggest set of value generators in the public sector: efficiency, effectiveness, transparency, participation, intrinsic enhancements and collaboration [17]. In this context, efficiency related to optimal usage of available resources with the increased output and effectiveness means to reach high-quality results. Referring an analysis conducted before, it can be concluded that OGD initiatives contribute to all of these six dimensions, consequently, adding value to public service provision.

2.5 Open Government Data as a tool to eliminate corruption risks

2.5.1 Understanding corruption

Technological innovations tend to transform public administration into more transparent and better version all around the world. Nevertheless, many societies still struggle with this phenomenon. Rajshree and Srivastava (2012) highlight that corruption “undermines the fairness, stability and efficiency of the services, corrodes the image of the public agencies and projects the state as predatory and unfair” [42]. As the natural consequences, society where corruption is flourishing is less favourable to adapt changes and develop. As it was summarized by Osborne (2004) corruption plays a role of impediment to modernization [37]. Lack of citizens’ trust towards righteousness of public bodies leads to non acceptance or ignorance of the government initiatives, which in its turn result in low usage of the newly introduced public services and inefficiency of the governance. Therefore governments have to prevent and eradicate corruption because it is an absolute requirement for prosperous society.

Rajshree and Srivastava (2012) point out that there are four kinds of corruption: bribery, favouritism, fraud and embezzlement [42]. Bribery can be explained as an action when beneficiary is giving money to the public in exchange for a service or special conditions. By its nature, bribery has three representations - extortionary, collusive or anticipatory. The first one, extortionary is when public official asks for a bribe as a precondition to provide any services. Collusive is when act of bribery is bilateral agreement between public servant and beneficiary. Conversely to extortionary, anticipatory is another way around, when the beneficiary is inclined to pay even when he/she has not been asked to in order to guarantee smooth and harassment free service delivery [42].

Another form of corruption is favoritism. An action when public servant abuses power in terms of privatization or distribution of the state resources is defined as favouritism. Nepotism is more common manifestation of favouritism. It is when preferences are given towards the family members [24]. Nepotism can be the reason of inefficiency in the public service provision due to employees that were chosen because of belonging to the specific family but not professionalism and competencies.

Embezzlement is an act of illegal possession of the government property by people who were assigned as responsible ones for taking care about it [42]. The last one, fraud is when political party during the election tries to influence the election with the methods such as, manipulation of information, trickery or distortion of facts by public officials aiming to mislead the citizens.

Every society faces corruption of different kinds and varying intensities. Governments together with international organisations are striving to eliminate corruption. Despite many methods have been developed to resist corruption but among the most effective and expedient ones are e-governance and open data technologies that enable access of the citizens to public information [58]. These tools became a part of the modern anti-corruption strategy. Openness, availability and sharing of the information can increase citizens' awareness and ability to make judgments, therefore reduce the scope of corruption [58].

2.5.2 AntiCorruption open datasets

Open government data agenda has been beneficial to the modernization of the many countries within recent years. Governments have recognized the real value of data and its potential to enhance efficiency of the governance, support innovation, reduce level of corruption, etc. There is one, well-known advisory institution in the field of open data - The Open Data Charter (ODC). This is a collaboration between governments and experts that can be seen as an advisory body for opening up data. As a great contribution to the anti-corruption strategy of the country, ODC has developed Anti-corruption Open Up Guide (see Table 2). Based on the analysis of how corruption works, authors have identified exact datasets that are related to the core elements of the corruption network. They have separated core elements of corruption network for four categories: individuals and organizations, public related resources, regulations rules and government procedures, rent extractions. Each of these elements is related to corruption sensitive field. It means that those datasets have to be open prior to any others because of their potential to reveal corrupt behavior. For instance, by opening International aid, funding & technical assistance register, individuals can see how much money have been received to fund a particular event or competition and track the result of its actual usage by purpose. Opening of another category – court records can show objectivity and unbiasedness of the judges, especially to the important individuals. Moreover, citizens can see what punishment has been applied to the guilty ones. Land and property register can reveal illegal possessions of the state lands or property. In the countries with the high level of corruption it happens quite often that politicians or other public servants illegally possess parts of the state lands without anyone noticing it. As an outcome, country is losing valuable resources and slowing down its development. The most critical and obviously corrupt dataset is government spending. Openness of this information can result in government to take real responsibility and being accountable for their spendings. Also it ensures that government eliminates corruption on the higher level.

Table 2. Classifying anti-corruption data. Source: [23].

Core element of a corruption network	Description of the related data to the core element	Examples of datasets
Individuals and organisations	Refers to any dataset containing records and information on entities (individuals or organisations) that can be potentially involved in a corruption scheme. Datasets under this category should provide information about the nature and characteristics of any entity, as well as its connections with others.	Lobbying registers; Company registers; Interests registers; Politically exposed people registers; Advisory boards; Government contractors; Public servants directories; Charity registers.
Public-related resources	Refers to any dataset containing records and information on the resources which belong to governments or are intended for public purposes and that could be involved in a corruption scheme. Datasets under this category should provide information about the status and transactions related to those resources.	Budgetary datasets; Government spending; Contracts; Public-private partnerships; Political financing; Licenses and permits; Grants and scholarships; Auditing datasets; International aid, funding & technical assistance register.
Regulations, rules and government procedures	Refers to any dataset containing records and information on the channels used, avoided or violated to commit an act of corruption by a corruption network. Datasets under this category should provide information about the procedures, events and legal acts potentially linked to corruption schemes.	Voting records; Meeting records; Court records; Campaign promises.
Rent extractions	Refers to any dataset containing records and information on the use of public resources that were potentially extracted as a result of a corruption scheme. Datasets under this category should provide information about the income sources and ownership of the assets owned by members of a corruption network.	Assets declarations/registers; Cadastre (including public land); Land and property registers; Tax databases; Customs data.

The mentioned above open anti-corruption datasets have to enable tracking of the suspicious activities and strengthen other anti-corruption initiatives launched by government or NGOs. Nevertheless, openness of this data does not guarantee efficiency of anti-corruption policies or tools. Disclosure of the data does not equal reduction of the corruption level. Authors of the guide emphasize, that “release of open data must allow the development of specific tools that are able to activate authorities and institutions with anti-corruption responsibilities and capabilities” [23]. This data has to stimulate cooperation between civil society organisations, journalists, private sector and citizens to develop innovative solutions, applications to fight corruption networks. The next step of this strategy is “investing in capacity-building for data analysis of government agencies, prosecutors, journalists and civic watchdog organisations” [23]. It can be concluded that opening of the government data is among the first steps on the way to formation of the less corrupt society.

3 Research methodology

In this chapter, the research methodology that has been chosen for this specific research will be discussed. Considering the specifics and analyzing the appropriateness of different approaches, a case study together with interviews as a part of qualitative method have been chosen.

3.1 Case study

The case study is a broadly used research methodology for obtaining in-depth, comprehensive analysis of an object, situation, phenomena or an issue in real life settings [57]. The authors regard that primary aim of this methodology is to analyze as well as to understand the issue from the participants' perspective. Such methods as focus groups, observations, interviews, documents, and artifact analysis are employed to facilitate the way of accomplishing the aim of the research. Yin (2014) emphasize that case study allows to develop new solutions based on the analysis and comparison of the existing information. This thesis conducts an analysis of the Ukrainian open data movement in terms of its influence on corruption and develop a set of recommendations for further improvements in this field. There are three most recognized categories or purposes of case study: exploratory, descriptive and explanatory [57]. The chosen one, i.e., the explanatory approach, analyzes the information within different dimensions and circumstances, in-depth in order to explain phenomena, in this context - why and how open data technologies in Ukraine contribute to the anticorruption strategy. In consideration of the defined above classification of the anti-corruption data [23], openness of these specific categories is compared and assessed. Apart from that, the following chapter includes a brief analysis of the existing projects/startups that aim to advance Ukrainian governance with open data technologies.

3.2 Qualitative analysis and its components

A qualitative approach is relatively flexible, allows to develop an overall research perspective and provides important textual data with the conception of the participants' set of values and beliefs [43]. As it has been emphasized by Koch et al. (2013), qualitative research helps to understand experiences of the participants that can result in more effective solution to the existing problem. This method addresses research questions and provides all the necessary tools to comprehend, analyze and answer them. In context of this research it is essential to analyze current situation and insights of the individuals who are part of the environment and involved in the process. In their research, Denzin and Lincoln, (2011) stress out that “qualitative researchers study things in their natural environment, attempting to make sense of, or to interpret, phenomena in terms of the meanings people bring to them” [9]. Therefore, within this research, the attitude of Ukrainians towards transparency, accountability of the government and corruption has been analyzed.

Qualitative research employs different data collection methods, such as: in-depth interview, group discussions, observational methods, narratives, etc [43]. Opinions of the competent individuals in the field of open data in Ukraine are crucial, and therefore a method of individual in-depth interviews has been selected. Interviews imply a detailed analysis of the interviewees' responses and personal perspectives in relation to the research focus [43]. All the data received during the interview process accomplishes ideas discussed in the thesis and enables formulation of the suggestions. Similarly to the case study, there are four categories of the research questions that are commonly used in qualitative method: exploratory, explanatory, descriptive and emancipatory [31]. Authors describe explanatory questions as the ones that seek to comprehend “patterns related to the phenomenon of interest or identify probable relationships shaping the phenomenon” [27]. As one of the purposes of the thesis is to investigate how open data is advancing Ukrainian governance, what fields it has influence on the most and how it helps to track and eliminate corruption, - explanatory questions are the most pertinent to use. Interviews have only ten open-ended and non-leading questions which are designed in the way to receive the most informative and specific answers that will support or object the hypotheses of the research.

In general, the research methodology is following an inductive approach. Apparently, the primary interest of the qualitative researchers is to understand a specific situation or behavioral characteristic of the particular group of individuals. Based on this knowledge they can propose a common suggestions regarding a particular problem. Bendasolli (2013) defines induction as “the form of reasoning based on empirical observation in the process of developing scientific laws and theories” [2]. Inductive approach in the thesis enables to use data collected from interviews and documentation analysis to develop recommendation on improvement of the open government data application in Ukraine to enhance its effectiveness.

3.3 Data collection

In the thesis, documents and interviews were used as main data collection methods. Runeson et al., (2012) have divided empirical data collection methods for independent and direct [44]. By independent method authors mean a document analysis. Academic articles, researches and other scientific documents related to the topic of the thesis were analyzed that helped to develop and systemize well-founded insight for further study. The direct data collection method is interviews. This method is adding value to the participants’ experience and interpretation of the actual situation. Interview questions were formulated in conformity with the obtained knowledge from document analysis. To specify, interviews have been carried on with the Ukrainian specialists in the field of open data and e-governance technologies. To counterbalance small number of interviews, experts from this particular field were invited. Interviewees specialization and experience are following:

- Interviewee #1 - Coordinator of the project «Building Transparent Cities in Ukraine» as a part of the anti-corruption NGO - Transparency International Ukraine (TIU).
- Interviewee #2 - Head of the Laboratory of E-Democracy in Ukraine, co-author of the concept of e-government development and action plan for its implementation in Ukraine, a member of the public council on e-government at the State Agency for e-Governance in Ukraine;
- Interviewee #3 - former journalist, media expert and parliamentary analyst, coordinator of a project for the development and implementation of an open data source portal for the Ukrainian Parliament, expert of the project "Data of the

cities" under the supervision of the civic organization "Support", open data management expert within the project on transparency and accountability in public administration and services, associate of Open Data Roadmap and Policy development team, Head of International Working Groups on Open Data in Ukraine - International Open Data Charter, Open Government Partnership.

- Interviewee #4 - Open Data Head/Team lead for Transparency and Accountability in Public Administration and Services (TAPAS) in Eurasia Foundation.
- Interviewee #5 - Open data analyst/advisor for the ministries and executives bodies in Ukraine.
- Interviewee #6 - Executive director in 1991 Open Data Incubator.
- Interviewee #7 - e-Services Team Lead at TAPAS project, Advisor of the Head of the e-Gov Agency of Ukraine, e-Government expert, interoperability specialist.

The qualified respondents ensure objectivity, expertise and unbiasedness of the collected data. In terms of this research, *seven* interviews were conducted. All the participants actively contribute to the transformation of Ukraine into the better version. Besides, all of them have different backgrounds and can analyse the situation from distinctive angles, that offers credibility to the study. All of the interviews were held between January 2018 - April 2018 via Skype due to the distance issue. The duration of each interview is about 15-30 min in total. Each interview includes open-ended questions only, which allows to comprehend respondent's way of thinking and understanding of a specific issue. During the interviews, it has been identified that a few questions are not relevant. Also, additional questions were asked in order to get more in-depth answers. The category of experts have been chosen for the interviews due to low awareness level of the ordinary citizens about OGD technologies.

3.4 Limitations of the research methodology

There are several concerns about the case study research methodology. The most notable limitations of this methodology are low rigorousness and an issue of generalization [54]. Lack of rigorousness has received the most criticism from academics. Yin (2014) describes, that "too many times, the case study investigator has been sloppy, and has allowed equivocal evidence or biased views to influence the

direction of the findings and conclusions”. Nevertheless, lack of systematic approach to the research can be avoided through methodological approach to be carried out by researcher at the beginning of the study.

Validity of generalization is another aspect that has been subject to skepticism. Generalization is rarely based on the single case for analysis. To mitigate the impact of this limitation, Yin (2014) proposes to set a goal in the research “to expand and generalize theories (analytical generalization) and not to extrapolate probabilities (statistical generalization)” [54]. Considering the goal of this research and its research questions, it is expected to receive adequate results. Implementation of the open data technologies accustomed to particular country. The analysis of the case study of Ukraine that comprises state of the art, and revised general theoretical background of the field, allows for creating an objective set of recommendations.

4 Case study

4.1 Analysis of open government data movement in Ukraine

Until recently, Ukrainian legislation in the area of access to public information did not provide any support to active disclosure of data, but was responding to inquiries from journalists, civic organizations or activists etc. Information from Ministries and other public entities could be only obtained by sending them an official request. Responding to requests can be a more or less acceptable way of information provision, however, there is always a significant risk of a) to not getting the answer; b) receiving an incomplete answer; c) receiving an answer in an inappropriate format (pdf-file, fax or paper). The amendments adopted in 2016 to the Act on access to public information oblige authorities to disseminate data in structured formats that enable automatic processing [51]. New resolution on open data sets clearly regulates requirements and formats of the publication of data and determines a list of more than 300 sets of data subject to mandatory disclosure. For submitting all these datasets, data.gov.ua - an open government data platform has been created. These innovations in Ukrainian legislation were preceded by a long-running pressure campaign - seminars and public discussions involving government officials, international experts, NGOs and IT businesses. A special group has studied international experience in the field of data discovery, compiled a list of data sets that are subject to disclosure in the first place, and promoted the idea of data discovery among government officials, representatives of state-owned companies and enterprises [6]. Opening of government data allows public and IT developers to create useful and user friendly public services. On the basis of open data, it is possible to create an entire ecosystem of electronic public services for the Ukrainian domestic market. This, in its turn, means the appearance of new workplaces and revenues flows to the state budget [26].

The current situation in the field of open data in Ukraine can be determined by a low level of government and business readiness and lack or low quality of key data sets.

Unfortunately, open government data goals such as accountability of the government, use of official data in the decision-making processes, citizens' engagement into governance, and development of socially useful services have not been achieved yet.

A concept of open data in Ukraine is based on the concept of e-government which follows principles, such as cooperation of public bodies and citizens, transparency of the functioning of public bodies for citizens and the involvement of citizens in the decision-making process. The process of data opening in Ukraine assures implementation of the main principles of e-government. Publication of data on the platform data.gov.ua is only a first step to accomplish expected results, because data itself has no value unless it cannot be used by the end-user (citizen). Aiming to improve current situation, various programs are developing to provide end-users with the services based on open data [18]. Thus, in the near future, citizens will be given tools to independently analyze government data.

The Ukrainian open government data projects can be evaluated in terms of their efficiency and usefulness based on two components - 1) to what extent are citizens involved and 2) are they provided with convenient data-sharing mechanisms. This is important as without citizens' participation in OGD projects, it is impossible to apply the component of feedback in public administration as well as to create public discussion about ways to solve problems Ukraine has, that have been detected by analyzing open data sets. Open government data in Ukraine has potential to establish transparent governance and bilateral citizen-to-government communication. World practice shows that fact of opening data related to the activities of authorities, encourages citizens to be more informed about possible problems and prospects of citizen-to-government interaction, and, therefore, in the future, to participate in developing new public services and decision-making process. Furthermore, citizens are delegated roles of the watchers after government's activities.

Ukraine is a country that can be characterized of a low level of citizens' trust towards governmental activities. The application of open data technologies in the governance is a first step towards change in the attitude of the society. Ukrainian NGOs and nonprofits are taking advantage of government datasets published on the different platforms. Monthly, they organize a number of events related to open data technologies in order to raise citizens' awareness and increase participation.

When it comes to implementation of new technologies, Ukrainian government tends to perform it in a decentralized way [45]. In this sense, OGD is not an exception.

Therefore, the establishment of the principles of open data at local levels is a particular interest of Ukraine. Efficient incremental development of local municipalities can not be realized without comprehensive use of OGD technologies. Aiming to develop prosperous and modern administrative districts, local authorities have to pay attention on the wide range of different activities, including: education, health, transportation, social security etc.

4.2 Examples of the successful open data implementation with anti-corruption purposes in Ukraine

As a matter of fact, Ukraine has been known as a country that is fighting the problem of corruption. Due to this reason, Ukraine is more likely to be associated with Latin America countries than European ones. Corruption is an obstacle for Ukraine and its great potential to be positioned as a strong member of international community. However, with the uprise of the digital age, technologies and information are key instruments to solve any problem, even such complex and rooted one as corruption.

Ukrainian public sector delivery system has been suffering from bribery and nepotism, political system from fraud and financial system from embezzlement and favouritism. In consequence, regular citizens see Ukrainian government as predatory one more than a supplier of the beneficial public services and guarantor of the bright future. Moreover, many individuals are not able to differentiate a corrupt and non-corrupt behaviour. Majority of Ukrainians agree on the idea that bribery is just a way to receive public services [8]. This state of affairs has been shifted by 2013-2014 Euromaidan revolution in Ukraine. A rapid rise of patriotism among citizens enhanced their faith in the new democratic regime without corruption. This changes in the attitude can be explained by the slight reformation and increased transparency of the public sector. Nevertheless, only the long term campaign has potential to reduce and eradicate so well-adapted culture of corruption in Ukraine. The hardest task for this campaign to accomplish is to change the attitude and behavioural habits of people towards the way of receiving public services as well as promoting the image of Ukrainian public services as transparent and efficient ones.

Contemporarily, the anti-corruption movement in Ukraine is growing and spreading dynamically. An enormous contribution to the development of new tools and solutions to reduce corruption level is coming from civil society organizations.

Initiatives and projects of NGOs along with the branches of international organizations are realizing anti-corruption strategy adopted by government on the national level. Representatives of the civil organizations are the ones who initiate public discussions and spread awareness about the problem and existing solutions. Civil society organizations mainly focus on application of OGD into the public sector aiming to intensify its transparency and accountability. Such intentions lead to introduction of many socially-useful products and services for citizens and government.

Prozorro is one of the successful and globally known e-procurement systems that uses open data technologies to guarantee openness and transparency of public tenders (procurement) in Ukraine. It has been established in 2016 as a hybrid of centralized public and decentralized private marketplace system. Since then, Prozorro is recognized as one of the most advanced procurement systems that delivers government services in a “stakeholder-focused, transparent, effective, fair and low-cost way” [40]. Prozorro enables the view of public purchases by region, analyzes who is the organizer of auctions, the amount of money raised as well as the amount managed to save with the help of the system. For example, the e-procurement system helped to preserve loses because of corruption and lack of competition that is around 60 billion UAH per year. Prozorro is responsible for saving about 10% of the overall public spendings due to increased transparency and competition. It improves the whole process of public procurement, increases transparency and activates a fair competition among businesses who are willing to provide products or services to the government entities. All the portal’s functionalities are available for every Ukrainian without any limitations to access. This e-service can be beneficial not only for those who are participating in tenders but for ordinary citizens as well, so they can track how budget money is spent.

OpenBudget is another source that helps to transform Ukrainian governance system into a more transparent and accountable one. This project concentrates on the idea to spread tools for processing open data among the municipalities that don’t have their own mechanisms to guarantee transparency of the financial sphere of the region [35]. OpenBudget tools allow to process income along with expenditure of the city’s budget. It is convenient for local authorities as data owners and citizens as users to get an access to visualized and easy understandable data. OpenBudget presents such data as, for example, the amount spent on renovation of a specific part of a city or spendings on kindergartens etc. Therefore, individuals can revise all the spendings and compare them to overall income in order to ensure legitimacy of municipality’s activities.

Another project that is based on OGD technologies is a platform with the tax declarations of Ukrainian politicians - declaration.com.ua. This platform has been created to analyze electronically submitted tax declarations of politicians through different categories. In terms of the recently adopted anti-corruption legislation, all of the judges, prosecutors, politicians have to declare and make public their income statement via electronic system. Therefore, declaration.com.ua enables Ukrainians to analyze and make judgments on trustworthiness of the politicians.

Rada4you is a unique instrument of e-democracy in Ukraine with a motto - “they vote for you”. This project has drawn attention of the politically active citizens. It allows individuals to know the actual position of politicians and to keep them accountable for what they actually vote for and what projects they support [41]. Politicians are known for giving promises but not keeping them. As a result of the implementation of Rada4you, Ukrainian politicians are being kept responsible for meeting expectations of their voters and follow the political campaign promises that they have been elected for.

The Transparency and Accountability in Public Administration and Services Program (TAPAS) has been established to support citizens and government in reducing and eliminating corruption in the key public services. Open data, e-procurement and e-services are considered to be key areas and the main focus of the organization. Aiming to build trust of Ukrainians towards government by demonstrating transparency, accountability, and improved services, TAPAS is fulfilling a role of advisory body for other projects in this field. There is a set of the clearly defined tasks to accomplish and expected results in every sphere of the main focus. For instance, TAPAS program aims to improve quality of the data, facilitate and encourage more often usage of OGD, foster public demand and capability of the key stakeholders to use and create new impactful public services within special events organized by them [49]. As an outcome, TAPAS team expects to foster innovation and development of the new public services based on open data technology that will lead to more advanced, transparent and better governance in Ukraine.

Data.gov.ua is an official Ukrainian data hub for submitting, collecting and sharing all the public datasets. As of today, 36723 datasets are available to the public domain on this portal, managed by the State Agency for e-Governance in Ukraine. Although, most of the information submitted on the portal is low-quality data that has to

be adjusted and updated. Hence, data.gov.ua will be renovated and all datasets will be converted to a correct format in order to prepare it for further re-use [7].

As another step towards greater transparency and accountability, Opendatabot platform has been created. Opendatabot is one of the best cases of using open data and publishing it as a single register of individuals and legal entities in Ukraine. Actually, on the basis of this register, other services were created that allow to monitor the owners and beneficiaries of enterprises and organizations, which significantly helps businesses and journalists [36].

Even when OGD is published in the correct format it still requires to be visualized or presented in an understandable way for ordinary citizens. For that purpose, Ukrainian think tank, texty.org.ua (data journalism agency) is taking responsibility for analyzing, interpreting the most important and valuable datasets for the public. This initiative focuses on contributing to the governance transparency through high-quality journalism as well as data journalism and promoting informed decision-making by citizens, politicians and civil society organizations. Additionally, they are willing to disseminate and promote “digital culture” among Ukrainian society [50].

1991 Open data incubator is a pioneer in Ukraine and the first non-commercial incubator that helps startups to transform and utilize huge amount of open government data into beneficial public services for Ukrainian citizens. Moreover, they organize competitions among startups with innovative ideas for the public sector. 1991 Open data incubator gives professional recommendations and advices on development and improvement of the projects’ strategies [60].

The last but not the least, a non-government organization that has taken the role of initiator and even, it can be said, a leader of the open data movement in Ukraine is Transparency International Ukraine (TIU). TIU consists of professionals in the field of transparency from around the globe that work together on the development of efficient tools and policies to eliminate corruption. As one of the most reputable anti corruption movements in the world, TIU spreads its activity on Ukraine. This organization holds responsibility for initiating various projects that aim to reduce level of corruption inside the country. Apart from that, TIU assists to Ukrainian policy makers with formulation of a proper anti corruption strategy for further its implementation [53].

To conclude, every project with OGD is a step towards formation of an open, corruption-free society, which stipulates favourable conditions for economic

development and supremacy of democratic rights. It may be observed that civil society organizations have overtaken role of the innovators in the OGD movement in Ukraine.

4.3 Analysis of anti-corruption datasets in Ukraine

Based on the international ranking Open Data Barometer that measures how governments are publishing and using open data for accountability, in 2016, Ukraine, has raised its position from 62 to 44 place in one year [53]. The most prominent achievement that has been recognized worldwide is e-procurement system Prozorro discussed in the previous chapter. In order to evaluate development tendency of anti-corruption movement in Ukraine, availability and quality of anti-corruption datasets will be analyzed and compared to the international standards (see Table 3). It is worth mentioning that Ukraine is taking one of the leading positions in exploitation of OGD among the neighboring countries.

It can be seen from the table below that most of the anti-corruption datasets are available for the public. Nevertheless, most of the datasets have insufficient quality that makes it difficult for further processing. Ukrainian experts for that purpose have suggested two criterias for productive usage and management of OGD. The first one is data quality, since only quality data in the sufficient format allows fast and efficient analysis [3]. The specific criterias for the data quality assessment are following:

- Machine-readable format;
- Completeness;
- Documentations - explanation of the data categories, meaning etc.;
- Data integrity;
- Unique identifier.

The second criteria is competencies and skills in data analytics. This implies involvement of the experts and professionals to the activities with open data to ensure its preparedness and define common trends. Ukraine has deficiency of the human resources in this field as well as lack of relevant trainings. Although, NGOs and other organizations are conducting trainings to enhance participants' professional skills, knowledge and expertise in open data. At this point, the main task of the government representatives is not only to publish missing datasets but initiate a bilateral dialog with the citizens. Component of the citizens' engagement is essential for making use of open data.

Table 3. Ukrainian anti-corruption datasets. Source: [3]

Available anti-corruption open datasets	Availability and quality
Budgetary datasets	High quality and completeness of data
Assets declarations/registers	Machine-readable format, incompleteness, insufficiency of documentation, archive records and identifiers.
Advisory boards	Not available
Government spending	Machine-readable format, identifiers, sufficient documentation, incompleteness, insufficiency of archive records
International aid, funding & technical assistance register	High quality and completeness of data
Government contractors	High quality and completeness of data
Auditing datasets	Not available
Campaign promises	Not available
Complaints on the public procurement procedure	Availability and completeness of data
Voting records of the politicians	Machine-readable format, identifiers, completeness, but insufficiency of documentation and archive records
Tax databases	Machine-readable format, identifiers, completeness
Court records	Machine-readable format, identifiers, sufficiency of documentation and archive records but incompleteness
Public-private partnerships	Not available
Contracts/tenders	Machine-readable format, identifiers, completeness
Cadastre (including public land)	Not available
Charity registers	Machine-readable format, identifiers, completeness
Politically exposed people registers	Available
Lobbying registers/Political financing	Available but insufficient format
Company registers	Machine-readable format, sufficiency of archive records but incompleteness, insufficient documentation and identifiers
Licenses and permits	Available but insufficient format

The table above shows that important datasets such as public-private partnership, cadastre, campaign promises, auditing and advisory boards are not available yet. Currently, Ukrainian civil society organizations are putting maximum effort to open cadastre (public land) data. Especially these datasets have high importance in Ukraine as this is one of the most corrupt fields.

Accordingly, OGD in governance is vital because availability of structured, complete, and standardized datasets together with appropriate tools and conditions will result in formation of powerful anti-corruption data infrastructure.

5 Analysis and discussion

Having analyzed the theory of good governance especially importance of transparency along with accountability as its components and corruption as a destructive factor of prosperous society, open government data has been suggested as possible solution. Corruption can be seen as an obstacle on the way to a good governance because it undermines government authority, trust of citizens towards efficiency of public services and hinders economic development. The case of Ukraine helped to scrutinize the role of open data as an anti-corruption tool.

5.1 Results and analysis of the interviews' findings

Exploitation of OGD keeps Ukraine on the right track towards change. Within recent years, many public services have been modernized and improved. Moreover, civil society organizations together with innovation enthusiasts are working on the development of new mechanism and services with the intention to change existing conceptions about public service delivery in Ukraine.

In terms of this research, interviews with Ukrainian open data and e-government experts were conducted. Most of the participants have leading positions in the projects that develop or promote OGD solutions in Ukraine. Competencies and experience of each respondent allow to consider their opinions as objective, substantial and unbiased ones. At the same time, experts' responses enable author to generalize and make concrete judgments regarding OGD movement in Ukraine. To generalize, based on the interviews findings, it can be said that Ukraine has an opaque transparency together with soft accountability. Even though, huge number of datasets have been made public, still it is not complete. Below, further detailed analysis of interviews will be provided.

At the beginning of the interviews, specialists were asked to define main problems related to open data in Ukraine. The most common and influential ones are as follows:

- extremely low motivation and neglection of the government officials to provide data in the appropriate format;

- lack of self-sufficient ecosystem for easy collection, systematization and use of open data;
- data quality;
- low citizens' awareness and interest.

Government institutions are parties that own and generate public data. They hold responsibility for the data format, its quality, and authenticity. All respondents have agreed on the lack of responsiveness and assistance of the public bodies whenever it comes to open data release. Despite adoption of respective law for OGD regulation in Ukraine, government officials still lack of trainings, motivation and knowledge on how to work with this kind of data. It has been concluded that public agencies can be separated on three categories: those who do not understand, do not want to or cannot provide data. Two respondents have experienced refusal to provide requested information from a government institution even despite the fact that this dataset is purposed to be open by law. One expert has told about the project that is purposed to help journalists to receive the requested data in the legal way. Basically they are granted fundings that should cover all the expenses when the case is going to court.

Nevertheless, it is still very common to observe such attitude of neglection from the side of public sector workers in Ukraine. However, more extensive problem is lack of understanding and competencies to be able to provide appropriate format of open data. Considering a necessity for open data to meet the standards, civil society organizations who deal with it, overtake the responsibility to convert data to the appropriate format. Thus, civil society organizations have to spend their limited time and resources in order to prepare data for further processing, despite the fact that it is not their responsibility.

One of the interviewees who works on the development of new quality e-services in Ukraine has pointed out that there are no unified classifiers presented as open data. Classifiers are important for systemization and grouping of the statistical data in the unified format. Ukraine has no single updated list of classifiers on the national scale. Each administrative district has its own classifiers that are based on different methodologies and hence are heterogeneous. Moreover, this sort of information is being changed often and has to be updated accordingly. For that purpose it has to be presented in the format of live(real-time) data. Classifiers are a backbone of e-services interoperability and Trembita (Ukrainian analog of X-Road). For instance, there is a tendency for establishment of new territorial administrative units in Ukraine. All of

them should be registered, and at the same time, information about each unit has to be updated accordingly. In order to provide e-services, it is important to receive accurate data of the user's location at the moment when request has been made. This location should belong to the particular territorial administration. Up-to-date identification of the territorial unit allows for coherent and precise service delivery.

Although major issue that have to be resolved is data quality. Quality of the data is directly correlated with its usability. All of the experts that were invited for interviews are dealing with data quality issues. Most of the time datasets are heterogeneous due to distinctive methodological approaches to its collection among administrative districts. Currently, as it has been mentioned before, all the startups that are developing their solutions on OGD have to moderate datasets into unified format by themselves before exploitation. State Agency for E-Government of Ukraine is responsible authority for regulations and control over open data quality on the national scale. They are elaborating and promoting methodologies of data collection for Ukrainian administrative districts. Regardless of the fact that there is no legal requirements, responsibility and regulations for this process, civil society organizations are initiating workshops and discussions with government aiming to resolve this particular problem.

From the social point of view, interviewees outlined, that Ukrainians have very stereotypical thinking that is a serious obstacle on the way of any technological advancements. They hard to believe in possibility of changes in Ukraine, especially in the case of corruption. These behavioural trends have been identified within the social campaign - "I do not give a bribe", coordinated by one of the experts. During this campaign ordinary citizens have been asked about the reason why they give a bribe and the answers were: "I give because I have no other choice or I give because its easier". It is commonly spread idea that without a bribe impossible to have smooth and fast public service delivery process in Ukraine. As a result people prefer corrupt behaviour over the dealing with bureaucracy and public servants neglection. Some of the experts even agreed that all the bureaucratic complexities related to public service delivery are only stimulating existence of corruption. These beliefs and perceptions explain low interest of the citizens towards new technologies and their potential. A possible solution for this problem, suggested by an expert, is to develop and enhance better understanding among the citizens regarding the actual harm of corruption for Ukrainian society. Also, in contrast to the negative effects, citizens have to see a possibility of the bright future of the free of corruption country, that offers many opportunities and perspectives for them.

Expert emphasized that it is impossible to eliminate corruption when there is not free access to the government data, and thus, information has to be open by default. Openness of the data will provide citizens with an actual evidence about the current state of the country. It will show expediency of the used by government resources and if all of them are used by purpose. Simultaneously, they will see potential and resources owned by a state that can be turned into the efficient driver towards better economic development. The most valuable contribution of ODG in this context is to be an initiator of citizens to government dialog. An easy access to public data makes citizens to provide a feedback on the government activities and, in the sense, to monitor and adjust them by creating public pressure effect.

A critical point when aiming for encouraging people to use OGD is to make it understandable. A regular citizen has to be able to comprehend the available information without any extra tools. The interviewee has mentioned “informational noise” as a related point to consider in this context. We live in the period of information noise when there is a data abundance. Even when we, for instance, scroll through facebook feeds, we see an array of information that it is simply not possible to be read entirely, and that leads to difficulties with filtering information. Consequently, data publishers have to think about the way data is presented so that it can draw attention and, at the same time, be informative and understandable for the reader. It can be achieved with the help of data analytics, visualization and infographics tools.

From another perspective, experts suggest to focus on the creation of e-services based on OGD. Ordinary citizens cannot make use of open data without acquiring special competencies. In this context, e-services is intermediate stage that links open data technologies and citizens. When citizens are provided with all the possibilities to receive public service flawlessly they will not consider corrupt behaviour as an option. Aside from quality public e-services, proactive information campaign have to be held. Experts summarized that there is a lack of effective information campaigns related to the public sector innovations. Sometimes citizens do not know about existence of the service due to inefficient marketing. Based on the experts’ recommendations, when launching new e-service systematic, a well-thought and productive marketing campaign is needed with a focus on informing and same time educating citizens on how to use it. At this point, it is highly important to increase digital literacy of the population category aged over 40. This category is showing the most resistance towards using Internet.

Considering the complexity of the corruption issue in Ukraine, one of the experts suggested to concentrate more on communication and media campaigns. Open data allows to publish datasets that belong to corruption vulnerable fields and hence can reveal some incidents (for example texty.org.ua). Analysts together with journalists have to shed the light on cases of corruption, especially those ones where legal actions were taken. Along with media campaigns, civil society organizations should initiate more public discussions and workshops where they examine the true nature of corruption and the effect it has on the society. An active interaction of government, civil society organizations, and citizens is a highly essential part of a productive anti-corruption campaign.

Ukrainian analysts think of open data as a source of brand new useful solutions for public sector. Basically, they are the “interpreters” of open data. Experts stressed out that analysts have the necessary knowledge, skills and vision on how to manipulate OGD in order to transform it into the e-services. At this point, author would like to suggest a hypothetical logical chain of how OGD can reduce corrupt behaviour in Ukraine (see Fig. 2).



Figure 2. Correlation of OGD and corruption

Open data by itself cannot influence the level of corruption. Openness of public data can only ensure transparency without accountability. But creation of public e-services based on OGD together with involvement of citizens and civil society organizations can lead to accountability of government bodies, and hence a less corrupt public sector. So far, Ukraine is close to reach a clear transparency of the public sector, but is not ready to provide the hard accountability. Experts emphasized that in spite of most of the anti-corruption datasets that have been made public, there are no efficient legislative measures and institutions that could be responsible for investigation of corruption incidents. At the moment, Ukrainian civil society organizations are contributing to the prevention of corruption. By using all available OGD tools and applications, they inform citizens about any corruptive behaviour of politicians that have been identified in one of the anti-corruption datasets. The awareness of citizens leads to public pressure effect on a specific case and individuals involved. Civil society

organizations empower citizens with a choice whether to trust involved politician in the future or not. From this perspective, experts have agreed that open data together with an active civil society have stimulative effect on the reduction of corruption in Ukraine but can be considered as only a preliminary action.

One of the experts evaluates the value of open data based two criteria. The first one is being a foundation for creation of the new socially-useful public services and products. The second one is to reduce the budget spendings and expose the corruption risks. When public information is available in the form of open data, that allows for minimizing time of the government officials for processing requests, etc. Expert emphasized that open data in Ukraine allows citizens to control and keep a track over government activities that in its turn ensures partial accountability that has some effect on the corruption decrease.

An interesting point to consider is that every respondent accentuated that especially their sphere of activity is the key one to resolve a problem of corruption in Ukraine. Basically, each of them have provided arguments that support their point of view foremost. Some of the interviewees had opposing ideas regarding data quality and format issues. For instance, one has been providing reasoning that supports importance of the law regulations as a primary prerequisite. From their perspective, well-thought policies applied on the national scale will speed up reaction of the public servants to collect and publish data in the correct format. Another expert has underlined the priority of technical regulations as the most influential factor to gain high quality data. It implies that the government has to hire technicians who will modify data to the correct format prior to any legislative measures.

The second conflicting statement that has been identified during the interviews is involvement of the government to anti corruption activities. Only three among seven participants have agreed that government role is crucial in OGD movement in Ukraine. In their opinion government has to take responsibilities of the regulatory body in this process, moreover, to contribute actively to its development. The rest of the experts disagree with this claim. They explain it with the lack of the government's interest to be a part of this movement. Generally, Ukrainian government is hard to reach when it comes to support of the projects initiated by civil society organizations. Most of the Ukrainian OGD initiatives are receiving funding from international sources.

The third line of argument is regarding the correct sequence of further actions to be taken for development of OGD in Ukraine. Majority of the experts have emphasized

the significance of educational and promotion campaign prior to other implementations. Ukrainians are not enough to publish government information only, they have to be told what opportunities and benefits it can bring. Low usage of OGD among citizens demotivates government officials to open data and publish it in an appropriate format. Attitude of the both sides of this process is interdependent and thus, actions applied to one side will affect another. Contradictory to this opinion, the rest interviewees recommended to focus, first of all, on quality of data. Quality OGD is purposed to simplify an overall data flow inside the state and result in development of the socially-useful public services that will enable the majority of citizens to use it without a large promotion campaign.

The analysis of interview findings provided the research with valuable insights and opinions of Ukrainian specialists in the open data field. There is no practical example of a country that has managed to eliminate corruption with open data technologies. But it can be explained by the difference in the level of economic development. The less developed societies that struggle with corruption lack the resources to ensure fast and efficient implementations of OGD and, conversely, in the developed ones where there is a sufficient amount of resources, corruption level is lower and is not prioritized. Therefore, statement that OGD have influence on the reduction of corruption cannot be taken for an axiom.

Nevertheless, the successful examples of OGD exploitation in Ukraine demonstrate that it has a real potential to reach this goal. There is an actual evidence of a slight decrease of corruption in Ukraine with implementation of OGD. Based on the international ranking - Corrupt Perceptions Index 2017, Ukraine has changed its position from 29th to 30th place in one year (a scale of 0 to 100 is used, where 0 is highly corrupt and 100 is very clean) [53].

5.2 Recommendations and suggestions for further improvement

Based on the analysis of interviews and the main problem statements, the author suggests at first to establish solid policies and guidance for open data in Ukraine. All the stakeholders should know their responsibilities. With the new regulations, government institutions will have to release data only in the respective format and thus simplify tasks for the ones who want to use it afterwards. Moreover, an appropriate legislative system will harmonize the open data movement in Ukraine.

Secondly, it is recommended for Ukrainian government to initiate trainings and workshops for public sector employees in order to educate them how to work with open data. Trainings can be conducted under supervision of Ukrainian specialists that have already worked on OGD projects. Trainings for government officials can result in a more productive and pleasant public service delivery process. Moreover, it is recommended to create favorable conditions for public servants to attend different events and conferences on technological innovation in order to enrich their knowledge, interest and competencies.

The third recommendation is to launch a promotion campaign for OGD utilization among business units. A productive cooperation with private sector will enable a creation of the new e-services and improvement of the existing ones for a better business environment in Ukraine. Open data is a potential source for innovation so businesses are provided with opportunities in this field that could help to develop a strong economy of the country.

The fourth recommendation is for Ukrainian government to provide financial aid that will cover all the expenses needed for hiring a special team responsible for data conversion to unified format. To ensure seamless data flow in Ukraine, all datasets for the last 10 years should be converted to a single open data format. Furthermore, taking into account that data is heterogeneous, this team is supposed to harmonize it.

Last but not least, government should initiate efficient and well-thought marketing campaigns for the citizens. Each introduction of a new technology or a public service has to be accompanied with an informational campaign. Government authorities in Ukraine should spread awareness about open data technologies to enable citizens benefit from them. Ukrainians as users have to understand the real value of OGD and public e-services based on it.

5.3 Limitations of the thesis

Among the possible limitations of the thesis, author can highlight few number of interviewees and lack of experts with the opposite or different ideas regarding OGD. There is a general concern about the chosen experts for interviews. Taking into account the research focus and scale, it would be more relevant to interview other representatives involved into the process such as stakeholders or citizens. Involvement of the other parties could help to develop better overview of OGD exploitation in

Ukraine. However, the current initial development stage of OGD technologies in Ukraine justifies the choice of the given experts only who are coordinating and improving its movement.

In addition, none of the interviewees had opinion that opposes an idea of implementation of open data into the governance or at least criticize it. In contrast to the positive feedbacks it would be advisable to receive some negative ideas as well. To mitigate this risk, author has highlighted conflicting ideas of the experts regarding OGD implementation aspects.

5.4 Future work

For further research author suggests to develop a concrete strategy or an action plan for citizens' engagement into OGD technologies and e-services built on it. Analysis of Ukrainian case has demonstrated that there is a significant need for greater citizens involvement into the process of a better and a more efficient use of open data. Ukraine lacks marketing campaigns and interaction of government with citizens. To ensure comprehensive analysis of the situation, different categories of average citizens have to be interviewed. Based on the collected data, there will be an opportunity to propose a smart and effective marketing plan that aims at improving the public service delivery system in Ukraine. Therewith, a less corrupted environment will be developed.

6 Conclusions

Value of government data is incredibly high. Government collects different sorts of data daily, without considering it as a strategic resource. With constant development of technologies we are no longer allowed to ignore benefits we can get from opening government data.

Analysis of theoretical approaches to the concept of good governance has outlined transparency and accountability as preliminary stages that help to reach better efficiency. Author has explained how those categories are changing the attitude of the citizens towards government, enhancing trust and establishing bilateral communication. Open government data has been interpreted in terms of transparency and accountability. OGD ensures transparency and induces accountability of governance. As an obstacle to the good governance, phenomenon of corruption has been investigated. Author has identified that corruption undermines government-to-citizen communication and negatively affects the overall development of the country. Consequently, a parallel has been drawn between open government data and corruption.

As an answer to the first research question, author has provided anticorruption open data sets. This table serves as a proof of the actual correlation of open data and corruption. It represents data categories that are the most vulnerable for corrupt behavior, moreover openness of this data made it possible to detect corruption and other abuse of the power.

The second and third research questions have been answered through case study and analysis part. The current stage of OGD development in Ukraine has shown examples of the public services created based on open data technologies. Considering relatively small contribution of the government to OGD movement in Ukraine, civil society organizations overtake the initiatives to create new public services that only proves stimulative effect of the open data. Moreover, during the interviews author has identified that open data not only entails new service creation but also activates business sector development by adding new solutions.

Author is predisposed to think that OGD has real potential to reduce corruption in Ukraine and advance public sector delivery. This conclusion has been made because of the following tendency discovered during the interviews' analysis. All the experts have agreed on the statement that open data is changing public service delivery system and reducing corrupt behaviour in Ukraine. Open government data has affected anticorruption strategy by adding IT solutions to the processes and generating new data-driven tools. Many different non-government organizations improve civil tech field in the country along with motivation of the citizens to be a part of this environment. Such a dynamic development of open data technologies in Ukraine will lead to formation of a prosperous and modern society. When governments open their data for public, they provide an enthusiastic IT community with the raw data for creation of new impactful public services and products.

It has rather already become a saying that “*who owns the information, he owns the world*”. This saying perfectly fits to understanding of potential of open government data technologies. With data in their hands, governments have power, in a good meaning of this word. The power to improve and facilitate lives of their citizens by establishing new public e-services, eliminating corruption and, therefore, creating a positive image about country as well as bringing it up to a new level of development.

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