Databases of Dignity: the politics of open data in post revolutionary Ukraine

by

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Abstract

In 2014, Ukraine experienced its most violent and dramatic event since the 1991 independence. The Revolution of Dignity resulted in the removal of a pro-Russian president from power and marked the country's geopolitical shift towards a closer association with the West. Among reforms introduced was the Open Data Law, which requires all government entities to publish public information in an open data format. The law led to the formation of innovative collaborations based on the development of open data tools and services. The goal was to address corruption, increase citizens' participation in political processes, and enhance electronic public services. Since the open data movement is still nascent, there is almost no academic literature examining its impact. At the same time, dominant discourses present open data either as a neutral and universally applicable tool or inherently 'good' technology in and of itself. These discourses neglect the embeddedness of open data in the broader socio-political structures and the role of individual actors in shaping its potentialities and limitations. I refer to critical scholarship in communication and technology and the field of STS to offer a more nuanced framework for examining the movement. I conceptualize open data as a space of convergence between social and technical domains. This space mediates the existing (geo)political tensions and, simultaneously, offers new forms of political agency characterized by democratic interventions into processes of the technological design. To examine these aspects, I conducted semi-structured interviews with members of the Ukrainian open data community, including representatives from government, civil society, and the startup community. The results demonstrated the presence of impactful civil-led initiatives, while also highlighting their complex interactions with post-Soviet institutional arrangements and Ukraine's geopolitical realities.

Keywords: open data, social movement, Ukraine, post-Soviet, critical theory of technology, technical citizenship, spaces of convergence, STS

To my parents.

Thank you for dreaming bigger for me than I ever could. I am who I am today because of you.

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List of Acronyms

API	Application Programming Interface
ARPANET	The Advanced Research Projects Agency Network
CDS	Critical Data Studies
CIS	Commonwealth of Independent States
EU	European Union
EUAA	The Ukraine – European Union Association
ICT	Information and communication technology
IMF	International Monetary Fund
NGO	Non profit organization
OPP	Open Parliament Project
ORE	Office of Research Ethics
PODP	Parliament's Open Data Portal
SCOT	Social construction of technology
SOE	State-owned enterprises
STS	Science and Technology Studies
TAPAS	Transparency and Accountability in Public
UPA	Ukrainian Parliament Administration
USAID	The United States Agency for International
WNISEF	Western NIS Enterprise Fund

Chapter 1.
Introduction

1.1. The Revolution of Dignity: A Look Back

When the peaceful Ukrainian demonstrators gathered on Maidan Square to protest against president Viktor Yanukovych's refusal to sign the EU Association Agreement (Shveda & Park, 2016), they had no idea that the demonstrations would eventually grow into the most violent and dramatic revolution since Ukraine's independence. For many Ukrainians, the European Union Association Agreement did not only signify political association and economic integration with the EU, but also a closer association with Western values of democracy. Even though Ukraine gained its independence from the Soviet Union in 1991, the country has struggled with reforming its political structures. Ukraine's system of governance was still characterized by the legacy of Soviet authoritarian regime and oligarchic monopoly, and rampant corruption permeated all levels of state and public institutions. Furthermore, the last four years of Yanukovych's rule were marked by the centralisation of power and repeal of the constitutional amendment and laws in order to increase the power of presidency (Pishchikova and Ogryzko, 2014). At the same time as the president and politicians were engaging in activities to enhance their wealth (Pishchikova and Ogryzko, 2014; Yanukovych Leaks, 2018), Ukrainian people faced high levels of unemployment with 435 thousand people registered as unemployed in 2013, among them 42.1% young people under 35 (Pishchikova and Ogryzko, 2014, p.86). Citizens grew increasingly frustrated and saw the cancellation to sign the association agreement as a step backward from desirable political and social changes in Ukraine.

On the same day when the Cabinet of Ministers issued an order to suspend the process of preparation for EUAA, hundreds of protesters showed up at night on the Independence Square, or Maidan, to express their opposition (Shveda & Park, 2016). As the number of demonstrators grew in the following days, political officials took measures to crack down the protests. In the early hours of November 30th, around 4:30am, two thousand members of security forces arrived to the square. Under the premise of clearing

the square for Christmas and New Year preparations, they used violence to drive the demonstrators off the protest site (The Economist, 2013; Kyiv Post, 2013).

> The police pummelled them with truncheons, beat them, sprayed them with tear gas and then chased them up a hill to beat them more. Never in its 22 years as an independent country has Ukraine seen such violence. (Economist, 2013)

These events turned the peaceful Euromaidan protests into a highly oppositional political movement with protesters building barricades around Maidan and facing violent confrontations with riot police. No longer did Ukrainian people just demanded integration with the European Union, they were now determined to put an end to the abuse of power by the authorities and push for the resignation of president Yanukovych. Several violent clashes took place between the protesters and the police starting from December 2013. The bloodiest armed confrontations happened between February 18 and February 21. The police used firearms against the protesters, and the media reported the presence of unknown snipers firing from the rooftop of the buildings close to the Maidan Square (BBC News, 2014). The events resulted in the death of over 113 protesters from firearms and other injuries (Shveda & Park, 2016). On February 21, the participants of Maidan rejected the compromising agreement between the president and the opposition leaders and stormed the Presidential Palace (ibid). Upon realizing the severity of the situation, Yanukovych fled the country and on the following day the Parliament removed him from the position of the President of Ukraine. This marked the end of the revolution and the beginning of a new stage in Ukraine's political development. The Revolution of Dignity highlighted Ukrainian people's determination to put an end to the unjust system and fight for a better Ukraine, sometimes at the cost of their own lives.

1.2. Tech Activism and Politics of Technology

The end of the Revolution was just the beginning of a challenging path towards the reform and stabilization for Ukraine. The following months were marked by Russia's annexation of Crimea and the eruption of separatist conflict, which led to the start of the present day civil war in the eastern region of Ukraine. At the same time, new political reforms and the unprecedented mobilization of the civil society brought new hopes that

the long awaited changes were finally happening. Political experts and observers pointed out a significant change in the level of civil awareness and the quality of civil society activities after Maidan (Pishchikova and Ogryzko, 2014; Jarabik & Minakov, 2016; Jarabik & De Waal, 2018; Burlyuk & Shapovalova, 2018). Unlike in the aftermath of the Orange Revolution of 2004, civil society did not stop carrying out their advocacy work and took an active and more coordinated part in collaborating with the new government and the international community to implement the reforms. Amidst those changes, a new form of activism became more prominent in Ukraine - "a form of technopolitics from the ground-up, which sees people's active engagement with technologies as a pathway to empowerment, equal participation and action." (Gutierrez & Milan, 2017) This new form of political engagement in Ukraine was enabled by the global developments of information communication technologies (ICTs) and technologies of big data, but also Ukrainian local developments, which mobilized the civil society, particularly its tech-savvy members, in contributing more actively to the political development of the country through the use of technology.

IT Namet, translated from Ukrainian as IT Tent, is an example of such initiative. It emerged right on the Independence Square, amidst the escalated events of the revolution (IT Намет, 2013). Among the activities of IT Tent team, which consisted of programmers and developers, were the installation and restoration of the damaged cabled networks during police assaults, creation of a website to help citizens to find their missing and injured relatives and friends, and the provision of digital devices, such as chargers and mobile devices, to protesters (IT Намет, 2013). IT Tent, alongside other tech initiatives, continued with their civic tech activities upon the end of the Revolution. YanukovichLeaks was another project led by Ukrainian journalists and activists, who recovered and digitized thousands of documents hastily dumped in the lake at Yanukovych's former residence as he escaped the country after the Revolution. Volunteer divers and the civil society community worked tirelessly for three days to retrieve 200 folders filled with thousands of invoices, contracts, insurance policies, and cash payment orders from the freezing lake (Mackey, 2014). In the following days, the documents were dried and sorted to be scanned and digitized. Investigative journalists continued working with computer engineers (UNDP, 2015) to investigate and expose the former president's regime massive misuse of public funds (Mackey, 2014; Yanukovych Leaks, 2018). They later launched the website

YanukovichLeaks to provide the local and international community access to the published data.

In the context of these examples, the Ukrainian civil society is turning to information and communication technologies to carry out bottom up initiatives and address prevailing social and political problems through technological means. The chief editor of Ukraine Digital News Adrien Henni commented (Ukraine IT Report, n.d.) it was not a coincidence that the same IT people participating in Maidan continued with political activities after the revolution. Among new tech developments, the open data movement emerged one year after the revolution, when a newly elected government introduced the Open Data Law, also officially known as the Law "On introduction of amendments into some Laws of Ukraine as to access to publicly funded information in the form of open data" (EU Public Procurement, 2015). It required all government entities to make public information accessible in the form of open data for the wider public to view, share, and re-use for any purposes, without restrictions. The institutionalization of open data resulted in the disclosure of important government datasets, such as datasets on public spending, the company register, the register of court decisions and, more recently, registry on beneficial owners of corporate entities (Onyiliogwu, 2017). It also led to the formation of a multifaceted movement involving diverse actors from both public and private sectors. They use the available open data to carry out research and investigations of the cases of corruption and develop electronic tools and services in various fields (UNDP Ukraine, 2015), including public administration, transportation, education, and entrepreneurship. In this sense, the open data movement represents a revolution-inspired vision of Ukrainian people to create a more transparent, democratic, and innovative country.

1.3. Overview of Thesis

In this thesis, I offer a critical framework for examining the open data movement in Ukraine. I argue that the introduction of open data in Ukraine has led to the formation of a new space for the civil society and other actors to enact a post-revolutionary vision of Ukraine through the use of open data. I examine the multifaceted interactions between social actors within the open data space, as well as their engagement with broader socio-political structures. The first chapter presents the literature from social constructivism and critical scholars in the field of communication, technology, and data to form an alternative

theoretical framework to study open data movements. The predominant theories on technology provide simplified accounts on the impact of technologies and data, portraying them either as neutral universally applicable tools or inherently 'good' technology in and of itself (Feenberg 2002; Kitchin 2014). These discourses neglect the embeddedness of open data in the broader socio-political structures and the role of individual actors and their interests in shaping its potentialities and limitations. To address these implications, I offer another framework for examining the open data movement based on critical scholarship in communication and technology, as well as formulations from the field of Science and Technology Studies. I refer to Peter Chow-White's and Miguel García-Sancho's concept of spaces of convergence (Chow-White & García-Sancho, 2011) to define open data as a socio-technical space of convergence, where social actors from various disciplinary fields and sectors are interacting and are shaping the meaning and use of open data according to their professional goals and interpretations. Their democratic interventions into the technical design and governance processes with a goal to create social changes in Ukraine represent what Andrew Feenberg (2017) refers to as 'technical citizenship", a concept that I will discuss in more details in the following chapters.

The Methodology chapter outlines the main steps in designing my research. I explain the rationale behind using semi-structured interviews and the way the chosen theoretical framework has informed the design of my interview questions. My fieldwork in Ukraine allowed me to gather insights from ten representatives of the Ukrainian open data community. In the data collection and data analysis sections, I discuss how I organized and thematized those insights to set the ground for my analysis in the next two chapters. Chapter Four refers to the concepts of interpretative flexibility and relevant social groups from STS to analyze the micro/meso-level interactions between social actors and their role in constructing the meaning and the use of open data in Ukraine. Interviews demonstrated that there are three main groups directly working on different aspects of open data: the government, the civil society, and the startup community. My analysis unpacks the linkages between those different groups of actors and examines specific cases of their interactions with power structures to uncover existing tensions and potentialities for democratic change. By paying attention to the role of power relations, I consider the critique raised by critical scholarship in technology and data studies (Kitchin & Lauriault, 2014; Dalton and Thatcher, 2014; Dalton et al. 2016) on the importance of acknowledging data's embeddedness in the wider systems of institutions, technological

infrastructures, and political regimes. One of the key findings in this chapter demonstrates a prominent role of the civil society in initiating the open data movement. By relying on their technological knowledge and data literacy skills and reserving to tactics (de Certeau, 1980), members of civil society were able to take part in defining the legal and governance frameworks of the Ukrainian open data movement.

Chapter Five places interview findings within the broader discussion and analysis of the political and geopolitical realities of Ukraine. The post-revolutionary period in the country is characterized by both an unprecedented level of mobilization in the civil society and a deeply entrenched culture of corruption and impunity in the state and public institutions (Jarabik & Minakov, 2016). Journalists and political observers referred to this paradoxical tension as Ukraine's 'hybrid state' (ibid). Interview findings confirmed that the same form of tension permeates the structures of the open data space, defining the challenges that social actors face in relation to institutional bureaucracy and resistance of politicians to support new changes. In the absence of an institutional base from which to enact changes, social actors often refer to tactical actions and use various technical approaches from within the system to reconfigure existing open data infrastructures and create change. In addition, they employ their social capital (Bourdieu, 2011) to gain access to influential circles to reach their goals. Interviews also showed that most of the open data organizations are funded by Ukraine's Western partners. By referring to historical accounts, I contextualize this finding in relation to the historical policy of the West of "building" democracy in post-authoritarian and post-Soviet countries, as well as Ukraine's recent shift towards a closer association with the West. The analysis of open data's politics and geopolitics adds a new dimension for understanding the dynamics of the movement.

In the Conclusion Chapter, I reflect on the initial goals of my thesis and recapture the main thematic narratives based on the interview findings. I also offer potential ways in which my research can be carried on forward. I conclude my discussion by evaluating the impact of open data movement on the current reform efforts.

Chapter 2.
Literature Review

2.1. Introduction

The Revolution of Dignity marked a significant moment for Ukrainian civil society in its mobilization to fight for the vision of a more just and democratic country. The open data movement emerged as a social movement led by civil society and other reform-minded actors to address prevailing socio-political and economic problems and push for new changes through the use of open data. In this sense, the open data movement represents a new form of convergence between social activities and the technological domain. Not only is this convergence defined by the use of open data as an informational tool for gaining insights on governmental activities, it also involves the participation of social actors in directly reconfiguring technological structures to enact social change. The examples of open data tools and services that emerged in prioritized reform areas point to the alignment of open data initiatives with Ukraine's post-revolutionary developments. Open data has become a medium through which Ukrainian reformers are enacting the vision of a more transparent, democratic, and innovative country.

Even though open data initiatives involve complex interactions between various actors and socio-political structures, mainstream discourses often simplify and exaggerate the impact of open data (Janssen et al., 2012) as a 'revolutionary technology'. They portray open data as a technological tool that brings positive results in a cause-effect manner without necessarily considering the context of its application (Gurstein, 2011; Janssen et al., 2012). This simplification obscures factors such as context, power relations, and the role of individual actors in shaping the dynamics of open data within a specific locality. A different framework that would consider those factors is therefore required for forming a critical approach to studying open data. In this chapter, I explore the work of social constructivism and critical scholars in communication and technology to propose a definition of the open data movement as a socio-technical space of convergence.

The first section of this chapter positions the open data movement within the historical and cultural conditions that social theory scholars in the sphere of technology

refer to as a new informational paradigm (Castells, 2010; Chow-White, 2008; Kitchin, 2014; boyd and Crawford, 2012). Recent developments in ICTs and Big Data have had a tremendous impact on various areas of human endeavour, ranging from everyday activities to the functioning of global political and economic systems. On a broader scale, the new informational paradigm has redefined power relations with respect to the production and ownership of information (Castells, 2010). In this context, open data is both a product of the new paradigm and a reaction to its specific inequitable conditions, including the non-transparent and proprietary control of the information. Open data relies on the same technologies, such as cloud computing, data storage, and data analysis, which enable opaque processes of datafication, to reconfigure and modify the technological structures from within and offer democratic ways of using those technologies. The second section will proceed to review the existing literature and studies on open data initiatives with a goal to identify what literature sees as their benefits and challenges and present its critique on certain interpretations of open data's potential. The critique will lay the ground for presenting the work of social constructivism, critical communication, and critical theory scholars who examine the relationship between power structures and the technological development. Their insights and concepts offer a promising alternative framework for examining the open data movement with the consideration of the socio-political context of Ukraine and the role of multiple actors in constructing the meaning and uses of open data.

2.2. Network Society: Power structures reconfigured

The rapid and intensified developments made in the last several decades in the field of ICTs and Big Data contributed to the emergence of new forms of knowledge production and types of social interactions based on technology and data. Among notable inventions since 1970s are the microprocessor, personal computer, optical fiber, and the first prototype of the Internet or ARPANET, which together enabled the formation of a global, interconnected and decentralized communication system (Castells, 2010; Ryan, 2010). Recent advancements made in the development of computational power, database design, distributed storage, and data analytics tools led to new possibilities of collecting, storing, and drawing meaningful insights from data in unprecedented volumes, velocity, and veracity (Kitchin, 2014; boyd and Crawford, 2012). As the result, a separate form of social development built on the earlier infrastructures of ICTs and Internet has emerged

under a new era of Big Data (boyd and Crawford, 2012; Chow-White & Green, 2013; Kitchin, 2014).

Social theory scholars, observing the scope and scale of changes, point to the formation of a new paradigm of social relations. This paradigm is centered around ICTs and Big Data (Castells, 2010; Kitchin, 2014; boyd and Crawford, 2012) and the reshaping of other social conditions, including, globalization and the restructuring of the capitalism system (Castells, 2010). Castells (2010) refers to the notion of a network society to conceptualize these changes. He describes the network society as a new social structure that is characterized by the prevalence of decentralized, flexible, and adaptable networks.

> Networks constitute the new social morphology of our societies, and the diffusion of networking logic substantially modifies the operation and outcomes in processes of production, experience, power, and culture. While the networking form of social organization has existed in other times and spaces, the new information technology paradigm provides the material basis for its pervasive expansion throughout the entire social structure. (Castells, 2010)

The implications of a newly formed technological paradigm are twofold (Castells, 2010; boyd & Crawford, 2012). On the one hand, a decentralized networked structure of the technologies promises more inclusive forms of participation and organization across various social dimensions and activities, including social movements (Milan, 2016; Castells, 2012). On the other hand, the same technological infrastructures are enabling an unprecedented level of data collection (Chow-White, 2008) and surveillance (Lyon, 2002, 2003).

Personal computing and the Internet have enabled a more decentralized and inclusive form of communication. The original Internet protocols, which “tie together diverse networks and govern communication between all computers on the Internet” (Ryan 2010, p.31) reflected the ethos of inclusiveness and openness of their initial developers – a community of young collaborators, mostly graduate students from the US. In an examination of the history of the Internet, Ryan (2010) notes that the way a team of graduate students developed these protocols and organized informal ‘network working

group' in the process "set the tone for the future development of the Internet culture" and "the tone of collaboration and discussion on the Internet thereafter" (Ryan 2010, p.31). The Internet system was designed as a loose arrangement of interconnected and autonomous network of devices that cannot be controlled from any specific point (Ryan, 2010). The technical infrastructure of the Internet in its early stages of development therefore mediated specific values of its creators on how the society should be like and enabled new forms of empowerment. As Feenberg notes (2017a), "where formerly larger-scale technical macro-systems symbolized the conquest of society by technology, now the personal computer seemed to reinstate the agency of the individual in the technical sphere" (p.102). The emergence of the Internet, and personal computer alongside with other technological inventions has therefore contributed to new opportunities for decentralized communication and empowerment.

At the same time, the aforementioned technological developments led to the restructuring of the global capitalism system and the amplification of existing problematic trends. Under the new paradigm the generation and processing of the information has become a focus of the capitalist system of production (Castells, 2010). Castells notes that unlike the previous mode of industrial economic development, where information was no longer useful once the initial purpose for which it was used was fulfilled, the current mode of development is characterized by the application of knowledge and information to knowledge generation and information processing/communication devices in a "cumulative feedback loop between innovation and uses of innovation." (Castells, 2010, p.31) In the restructured system of capitalism data have simultaneously become a raw material, the product, and the source of profit. The productivity and competitiveness of today's organizations and institutions depend on their ability to use technologies to "generate, process, and apply efficiently knowledge-based information." (Castells, 2010, p.77) Scholars stress the central role of database and data-mining technologies in the informational economy, networking information, and the production of institutional knowledge (Elmer, 2004; Gandy, 2009; Manovich, 2001; Chow-White & Green 2013). The evidence to this is the rapid development in the past decade of multibillion dollar data marketplaces that sell and acquire data (Kitchin, 2014) and the emergence of multinational technology and internet companies positioning themselves at the forefront of the data collection processes (Richterich, 2018). A data monopoly emerged with a few big companies and government institutions cautiously guarding some of the most important

and powerful datasets on health, consumer behaviour, and economic activities (Richterich, 2018, p.9).

The trends of datafication that underlie economic activities also permeate other spheres of human activities with implications for privacy (Frizzo-Barker & Chow-White, 2014) and our ability to exercise political agency (Gurstein, 2011, Richterich, 2018, Chow-White, 2008). With the availability of data storage and data-processing technologies, our online activities are now subject to the unprecedented level of data collection and categorization (Chenney-Lippold, 2017). Categorizations, such as race, gender or political affiliations, are assigned to us by advertisers using predictive computational techniques without our direct consent or ability to influence the process (Chenney-Lippold, 2017). Informational technologies have restructured the mechanisms of surveillance into a new and less explicit form (Lyon 2002; Chow-White, 2008). Roger Clarke (1988, p.499) coined the phenomenon as "dataveillance" or "the systematic use of personal data systems in the investigation or monitoring of the actions or communications of one or more persons." Now "it is our data that is being watched, not our selves." (Chenney-Lippold 2017, p. 22) The question of who owns and controls data in the increasingly datafied society becomes a question that relates to one's ability to exercise agency. Having or not having a say over what data are collected, how, and for what purposes have tangible consequences for our lives, delineating the limits and possibilities for our actions.

In the light of discriminatory and proprietary datafication trends, a range of socio-technical practices and movements emerged to advance new rationalities in response to ubiquitous datafication processes. They interrogate the fundamental paradigm shift brought about by datafication (Milan & Velden, 2016), aim to support and empower the public (Baack, 2015; Gutierrez & Milan, 2017), and advocate for the treatment of data, not as a commodity or a private asset, but a matter of civil rights, personal autonomy, and dignity (Richterich, 2018). Among these new forms of data activism (Milan & Velden, 2016), the open data movement emerged to further the vision of data as public commons accessible to everyone to access, use, and share. The movement represents the ethos of openness that accompanied the earlier technological developments (Ryan, 2010) and open source movements (Baack, 2015). It brings a promise of creating new forms of knowledge and types of actions that are more transparent, democratic, and aligned with people's vision for a just society.

2.3. Open (Government) Data Movement: A Closer Look.

The open data movement embodies a new form of agency in the network society that emerged as a reaction to the proprietary and non-transparent ownership and uses of data. It can be also defined as the application of Big Data to civic actions, where the application of Big Data is not about the volume of data but the ability for data to change the way we understand its subject (Tauberer, 2018). The movement aims to re-distribute the mechanisms of knowledge production and control for more inclusive and participatory use by everyone on a non-discriminatory basis. Through the engagement with data and use of data-driven technologies, the public aims to realize its own imaginaries, values, and rationalities and re-articulate notions of democracy and participation (Baack, 2015).

The open data movement takes its inspiration from the open source movement and the scientific community (Coleman and Golub, 2008; Chignard 2013), which were the first ones to re-articulate the idea of knowledge as a common good. Open data is defined as "data that can be freely used, reused and redistributed by anyone - subject only, at most, to the requirement to attribute and sharealike." (Open Knowledge International, 2018) Under those principles, advocates call for the publication of publicly funded data in academic, research, public health, and government institutions. The availability of data in an open format allows for the public to gain new insights, participate in re-configuring data infrastructures, and produce new knowledge through collaborative work. Specific technical formats and data structures of open data ensure that data can be accessible, read using available software tools, freely shared between users, and enriched by combining different sources of data together to draw new insights and create new tools and services (European Data Portal, 2018).

The open government data movement in specific lies at the intersection of open data and open government and is data that is published by government entities and government-controlled public organisations (Kucera & Chlapek, 2014). This includes the information collected on meteorological and traffic data, registered businesses, economic, and political activities – most of them are funded by public taxes (Ubaldi, 2013). The civil tech society, particularly the proponents of open source, were the key actors in initiating the open government data (Tauberer, 2018). They were initially the participants of the free software and cultural hacking movements that contributed to many innovations in the field

of computers and the Internet (Chignard, 2013). In this sense, the open government data embodies the spirit of openness and inclusive participation that defined the earlier developments of the Internet by the hacking community. In 2007, thirty tech activists, including Tim O'Reilly, the originator of various Internet movements, and Lawrence Lessig, the founder of Creative Commons license, met in Sebastopol to set out eight principles of open government data. The work of open source advocates played an important role in initiating the open government data movement in the US (Chignard, 2013) and later in other countries. A year after the Sebastopol meeting, US President Barack Obama took the office and signed a presidential memoranda, which reinforced the principles defined in Sebastopol, making open and machine-readable data the new default for government information (Open Government Initiative, 2013). The open government data movement gained an institutionalized character, spreading and adopting in various localized forms in both developed and developing countries**.** The Open Government Partnership, a multilateral initiative, was established in 2011 to secure concrete commitments for the government participants in regards to the principles of publishing open data (Open Government Partnership, 2018).

The existing studies on the open government data highlight its social, political, and economic benefits (Tauberer, 2018; Janssen et al., 2012; Kucera & Chlapek 2014). In terms of political and social benefits, open data promises greater transparency and accountability, increased trust in the government, improved policy making processes, and the creation of new insights within the public sector (Janssen et al., 2012; Ubaldi, 2013). Citizens can rely on data-driven insights to influence governance and policy-making processes (Davies & Bawa, 2012). Their availability also encourages citizens, non-profits, businesses, and academic community to take part in developing data-driven services and products, thus contributing to the technological innovation and economic development (Huijboom & Van den Broek, 2011; Robinson et al., 2009). Keeping those positive aspects in mind, the academic literature also highlights some challenges. Kitchin (2013) discussed the problems associated with the lack of sustainable financial model. He also noted how the studies of a number of different open data projects demonstrated a predominant focus on the technical aspects resulting in the publication of datasets with no attention to quality, usability, or consequences of their use (ibid). The review of the studies on open data policy-making (Zuiderwijk and Janssen, 2014) and implementation (Donker & Loenen 2016; Dawes et al., 2016; Heimstadt et al., 2014; Koznov et al., 2016) have also shown

that the literature on open data itself predominantly focuses on the administrative and technical aspects of open data challenges and their solutions. The understanding of specific technical issues and existing caveats in funding models are highly important to ensure the long-term development of open data initiatives. However, those insights offer localized solutions and provide little help in contextualizing the use of open data in respect to complex human interactions, which are are shaping it, as well as the broader socio-political conditions.

A smaller number of studies refer to specific ontological understandings and framings of open data and power relations to discuss the existing challenges in the field. The study by Janssen, et al. (2012) mentioned the tendency of mainstream accounts to oversimplify and construct the myths around the benefits of open data. For instance, predominant among policy-makers is the assumption that publishing data in and of itself will automatically yield benefits for the society (Janssen et al., 2012). The other common myth is that the availability of open government data directly results in the creation of a transparent and accountable government (Janssen et al., 2012) and the enhancement of democracy (Strathern, 2000). The portrayal of technologies as neutral universal instruments for unproblematically achieving social goals is a common discourse in the field of policy-making and social sciences (Feenberg, 2002). The principles of openness, transparency, and inclusivity that define open data often act as a powerful discursive shield or what Levy and Johns (2016) refer to as 'Trojan Horse' and obscure alternative political goals for which open data can be utilized. The simplified instrumentalist accounts leave out important questions on how open data is interacting with the existing power structures and regimes. Reigeluth's (2014) statement is particularly relevant in elucidating this situation – technology should not only be seen in terms of change, revolution or novelty, but also in continuity with existing social developments. Open data, rather than being a universally applicable tool, inevitably interacts with and mediates power relations.

Overall, most of the reviewed studies on open data initiatives tend to focus more on technical and administrative mechanisms of their functioning. While those studies are particularly strong in using empirical approaches and highlighting concrete issues in open data processes, in their discussions they rarely direct the attention to broader socio-political conditions and power inequalities. Those factors nevertheless play a significant role in limiting/enabling the impact of open data. In relation to Ukraine's case, broader

political structures and power relations are important factors to be considered alongside with the examination of specific empirical case of open data initiatives. There is therefore a need for a theoretical framework that provides a critical approach to studying open data movements and does not neglect the empirically informed evidence. To address these implications, I refer to the critical body of literature on data and technology. I will first start by introducing initial provocations from scholars in a newly emerging field of critical data studies (CDS). They point out to the urgent need to form a different understanding of data and socio-political conditions that frame them. I will then refer to social constructivism, critical communication studies, and critical theory, which I believe can offer relevant theoretical formulations and methodological concepts for addressing CDS' call of alert and carrying out the critical examination of the open data movement.

2.4. Critical Approach to Studying Open Data Movements

2.4.1. Provocations of Critical Data Studies

Critical data studies (CDS) is a new interdisciplinary field that was formed to address the existing implications of data-driven artifacts and infrastructures. It emphasizes an urgent need to reflect on and enact a new direction in the study of data. CDS aims to move beyond the positivist study of data (Iliadis & Russo, 2016) and builds on the body of critical social theory (Kitchin and Lauriault, 2014) to examine data in the way that acknowledges their "embeddedness" in the social structures of various regimes, apparatuses, and human relations and the implications they have on the society (Iliadis and Russo, 2016; Dalton et al. 2016; Kitchin and Lauriault, 2014; Dalton and Thatcher, 2014). Literature on CDS is still nascent in number and scope. The key defining texts of CDS include *Critical Questions for Big Data* by boyd and Crawford (2012), *Towards Critical Data Studies: Charting and Unpacking Data Assemblages and Their Work* by Kitchin and Lauriault (2014), and *Critical Data Studies: A Dialog on Data and Space* by Dalton et al. (2016). These texts in one way or another mention social theory scholars, who for long time have been analyzing the interrelation between technological development and the social processes of knowledge production, power and resistance, and subjectivity. Among them is the French philosopher Michel Foucault (1980), who both studied and conceptualized the historical embeddedness of power and knowledge practices and the mechanisms through which power/knowledge is enacted in structuring

the society. Foucault's work inspired the work of scholars in surveillance studies (Lyon, 2007), who analyzed the implications of information/data control and collection (Deleuze, 1992; Gandy, 1993; Lyon, 2002; Lyon, 2003) decades before the emergence of Big Data and CDS. With the coming of the Big Data Era, scholars from the second wave (Elmer, 2003; Chow-White, 2008; Manovich, 2011) continued building on the work from surveillance studies and other critical scholarship on data (Bowker & Star, 1999; Gitelman, 2013) to conceptualize the new emerging social conditions and discourses. As an interdisciplinary field, CDS refers to the formulations of the aforementioned scholarship and welcomes new theoretical and empirical perspectives in studying data.

Critical data scholars challenge the idea that data represent an objective abstraction of the real world (Gitelman, 2013; Bowker & Star, 1999) and instead conceptualize them as dimensional, always situated, and framed (Kitchin and Lauriault, 2014). As an aggregation of units of information (Gitelman, 2013) and representation of knowledge (Kitchin and Lauriault, 2014), data plays an active role in shaping our understanding of the world and consequent actions based on this knowledge (Gitelman and Jackson, 2013, p.9). Data-driven processes are guided by different disciplinary and institutional norms and therefore are subject to the knowledge and power regimes. What counts as good or reliable data and what kinds of phenomena can be represented through data (Gitelman & Jackson, 2013, p.3) are questions that are resolved in the process of negotiation, debate, and conflict. Just as technology, data are also contingent and socially constructed and "do active work in the world" (Kitchin and Lauriault , 2014).

In regards to open data, the critical data scholars emphasize its embeddedness in existing power regimes and resultant implications. In her study of the open data movement in the UK, Bates (2012) notes that the open data initiative had little political traction until big businesses started to actively campaign for open data with the interest to "get access to expensively produced data for not cost, and thus to a heavily subsidised infrastructural support from which they can leverage profit" (as cited in Kitchin, 2014, p.61). Bates' case emphasizes the risk of open data's co-optation by corporate interests, regardless of the movement's initial purpose of countering the same datafication and profit-oriented trends. Gurstein (2011) extends the argument on the uses of open data for private interests to the wider issues of power inequity, where the factors, such as data literacy, access to relevant software and tools, and financial capital, only empower the already empowered without

bringing positive changes to the disadvantaged ones. In his examination of the digitization of land records in Bangalore, Gurstein (2011) described how the available open data on land ownership and land titles was exploited by middle and upper income people and by corporations to gain ownership of land from the marginalized and the poor. In this light, the availability of data does not guarantee the immediate fulfillment of its principles.

> The open data movement largely seeks to present an image of being politically benign and commonsensical, promoting a belief that opening up data is inherently a good thing in and of itself by democratising data. For others, making data accessible is just one element with respect to the notion of openness. Just as important are what the data consist of, how they can be used, and how they can create a more just and equitable society (Kitchin, 2013).

The critique, which scholars provided in their case studies, emphasizes the need to approach the study of open data and its impact beyond the embellished discourse of openness and in relation to its social constructedness and, therefore, a capacity to serve various interests to both empower and disempower. Kitchin and Lauriault (2014), who in their work outlined the direction of development for CDS, suggest scholars to enact CDS by examining what they call data assemblages. In other words, one enacts CDS by "unpack[ing] the complex assemblages that produce, circulate, share/sell and utilise data in diverse ways; to chart the diverse work they do and their consequences for how the world is known, governed and lived-in." (Kitchin and Lauriault 2014, p.6) The concept draws on Foucault's notion of dispositif that refers to a "thoroughly heterogeneous ensemble consisting of discourses, institutions, architectural forms, regulatory decisions, laws, administrative measures, scientific statements, philosophical, moral and philanthropic propositions," (in Gordon 1980, p. 194) which reinforces and maintains the exercise of power in the society. Kitchin and Lauriault also suggest that philosophical interrogations of data to be accompanied with qualitative empirical approaches, such as ethnographies, focus groups, and interviews to shed the light on the functioning of data assemblages and discursive regimes (Kitchin and Lauriault, 2014).

While a diverse body of work emerged in various domains and areas based on the CDS framework ranging from food and agriculture (Bronson & Knezevic, 2016) to civic

data and datactivism (Currie et al. 2016), CDS still requires long-term projects that address specific challenges of the field and propose ways to critically examine data (Iliadis & Russo, 2016, p.3). As a nascent field, CDS consists of “a loose knit group of frameworks, proposals, questions, and manifestos” (Iliadis & Russo 2016, p.3) and requires systematic theoretical and empirical approaches (Kitchin and Lauriault 2014; Iliadis and Russo 2016).

The theoretical and methodological formulations from social constructivism, critical communication studies, and critical theory offer relevant frameworks to address the aforementioned concerns. Unpacking and examining data assemblage require both an empirically-oriented study of its constituent elements and theoretical formulations that would help to analyze the workings of power and social structures. In forming the theoretical framework of this thesis, I also took into the consideration the formulations which would allow to conceptualize the evolvement of open data specifically in the context of Ukraine’s distinct historical moment marked by the country’s aimed transition towards a more democratic regime, the introduction of new reforms, and the unprecedented mobilization of civic society.

2.4.2. Science and Technology Studies.

Science and Technology Studies (STS) offers an empirically-oriented theoretical framework to understanding technological development as a socially constructed process. The approach emerged in 1980s as a social constructivist turn in the study of scientific knowledge and technological systems. STS challenges the common-held deterministic assumptions about the objective nature of science and technology and does so by combining the sociology of scientific knowledge and technology studies approaches (Pinch, 1996). STS emphasizes that “technology does not follow its own momentum nor a rational goal-directed-problem-solving path but is instead shaped by social factors” (Bijker, 2001, p.26). Since the emergence of STS, different strands and approaches developed in the field (Klein & Kleinman, 2017), including the social construction of technology (SCOT) developed by Pinch and Bijker (1984), the actor-network theory mainly formulated by Bruno Latour (2005) and Michel Callon (1999), and the systems model developed by Thomas Hughes (2012). While each of those strands and approaches present important differences in their study of technology, they have a fairly consistent

viewpoint in refuting the distinction between social and technical worlds and highlighting the inseparability of both in shaping the meaning of technological artifacts (Winner, 1992). The development of technology takes place in an integrated environment that includes interactions between people, social institutions, and various technical artifacts and infrastructures.

In particular, SCOT (Pinch & Bijker, 2012) explains how the meaning and uses of technological artifacts are a result of communicative actions between diverse social groups, who determine the artifacts' further development and use. SCOT therefore suggests to consider the role of various social groups in shaping the meaning and the material development of a specific technology. It offers an analytical framework to describe the process of technological development from the very initial stage of negotiating the technology's meaning to the last stage when the meaning of a particular technological artifact is stabilized. In their seminal work "The Social Construction of Facts and Artefacts", Pinch and Bijker (1984) described the main concepts of SCOT: relevant social groups, interpretative flexibility, and stabilization. According to their approach, every technological artifact is designed with the involvement of what the scholars call relevant social groups or "institutions and organizations, as well as organized or unorganized groups of individuals." (Pinch & Bijker, 2012, p.23). Each group is distinguished by different competing interpretations of how the technological artifact should be used and problems that it can solve. The interpretations and decisions made by social groups in turn lead to different design choices and uses of the technology. To describe the contingent nature of interactions between relevant social groups, Pinch and Bijker (1984) introduced a concept of interpretative flexibility. Referring to this concept, the development of the technological artifact is an open process that can result in different versions depending on the interpretations of an artifact by social groups and the way they resolve disagreements regarding those different versions. Typically, in the process of negotiation and problem-solving one meaning of the artifact will gain dominance (Bijker, 2001). This is when the process reaches what Pinch and Bjiker (1984) call the stage of stabilization and interpretative flexibility disappears.

In demonstrating the presence of various competing interpretations, STS follows the principle of symmetry whereas both successful and disregarded versions of a specific

technology are taken into account. STS therefore challenges the myth of the naturally evolving autonomous technology and offers a “multi-directional” model, as opposed to linear models of technological development. In doing so, it allows to consider the overlapping effect of different social groups and institutions (Bijker and Pinch 1984, p. 410). In Pinch and Bijker's (1984) famous sociological enquiry into the early designs of bicycles, the authors demonstrated how a commonly accepted version of the bicycle with two equal-sized wheels instead of the high-wheeler with a larger front wheel, was the result of negotiations by different groups on issues, such as speed and safety considerations. Other case studies employing the STS approach address various fields and areas and include MacKenzie's (2012) examination of the negotiations over the definition of missile accuracy and Bijker’s (2012) studies of Bakelite and fluorescent light.

SCOT, with its focus of examining localized multifaceted interactions, comes as a relevant approach for examining the development of the open data movement. As a technological construct lying at the intersection of multiple fields of technology, governance, activism, and entrepreneurship among others, open data involves the participation of various social actors in shaping its development and implementation. The constructivist approach enables one to empirically capture in a clear and step-by-step manner the contingency of open data development using the concepts of interpretative flexibility and relevant social groups. SCOT’s empirically-informed approach can also enhance the philosophical formulations of technology and data by providing concrete empirical examples of the social construction of data. In respect to Ukraine’s case, the open data movement involves diverse groups of actors from private and public sectors with different interpretations and localized motivations in using open data. Since the Ukrainian movement is relatively nascent, different visions are currently in competition with each other in defining the meaning and uses of open government data and, in long term, its impact on the Ukrainian society.

Keeping the potential of SCOT’s methodological tools in mind, scholars critique STS for its extensive focus on the “agent-or action-centered perspective” (Sismondo, 2010, p.200; Klein and Kleiman, 2002) and lack of attention to wider social consequences of technology (Winner 1993; Williams & Edge 1996). While STS developed methodological tools and concepts with which to examine political controversies and power struggles, it has not extensively used them to address these aspects (Feenberg,

2017b). In other words, while the social constructivist approach succeeds in demonstrating the role of social actors in the technological development, its historical contingency, and the presence of numerous technological alternatives, it does not refer to the questions of 'why' and 'to what effect' to explain the reasons why certain versions of a technological artifact dominate over others and the consequences of a technological choice on people's sense of self, the society, and the broader distribution of power (Winner 1993, p.368). The formulations by SCOT and STS makes it difficult to understand the nature of social conflicts in a heterogeneous environment characterized by power imbalances (Feenberg, 2017; William & Edge, 1996). This aspect is however critical for the analysis of the Ukrainian open data movement that evolve on a terrain which is characterized by bureaucratic structures, power abuse, and the lack of rule of law. Reflecting on their approach, Pinch and Bijker themselves acknowledged that "[SCOT's] model is not used as a mold into which the empirical data have to be forced. The model has been developed from a series of case studies and not from purely philosophical or theoretical analysis". (Pinch & Bijker, 2012, p.30) In this context, the fields of critical communication studies and critical theory offer relevant complementary formulations to address this gap.

2.4.3. Critical Communication Studies & Critical theory

Scholars of social theory and communication have a long-standing tradition of analyzing the role of social and political structures in shaping human social condition and the use of technology. Since the 1920s they have been examining and deconstructing ways in which social and political structures shape various dimensions of the society, including the use of technology. The theoretical formulations in the field provide a framework for understanding the role of power structures in impacting social interactions around open data and conceptualizing acts of agency within the domain of technology.

Influencers and thinkers of the Frankfurt School, including Horkheimer, Adorno, and Marcuse, were among the first scholars to systematically study and theorize ways in which technology embodies and reinforces values and interests of the dominant groups (Feenberg, 2017b). In a similar way to STS, the critical theory formulated by the Frankfurt School refutes the idea of technological neutrality, but takes a step further to discuss the implications of power structures and ideology in determining the uses of the technology. A German philosopher Martin Heidegger (1998), whose ontological formulations on

technology influenced the work of Frankfurt School thinkers, challenged the traditional ways of understanding technology – the anthropological view, which states that technology is just one for of human activities among others, and the instrumentalist view, which frames technology as a neutral tool that humans use in a calculated and conscious manner. Instead Heidegger argues that technology exists prior to one's conscious action and reveals human's relation to reality. By relying on the concept of enframing, he states that modern technology places the limits on human awareness according to the ideas of efficiency and calculated use (Heidegger, 1977). Herbert Marcuse (1998, p.41) argues that in the modern era technology has become a "mode of organizing and perpetuating social relationships, a manifestation of prevalent thoughts and behavior patterns, an instrument for control and domination". The formulations offered by the Frankfurt School are highly influential in providing a basis for theorizing and critiquing the relationship between power and technology in the modern society. Nevertheless, they advance a pessimistic view of technology as the tool of domination and oppression (Feenberg, 2017b) and therefore pose limitations for conceptualizing ways technologies are used for empowerment and social change, such as in the case of the open data movement.

> ...most modernity theorists overlook the struggles and innovations of users engaged in appropriating the medium to create online communities or legitimate...innovations. In ignoring or dismissing these aspects of computerization, they fall back into a more or less disguised determinism. (Feenberg, 2005, p. 60)

Recent developments based on the critical theory nevertheless provide a promising ground for conceptualizing democratic interventions in the domain of technology with the acknowledgment of power structures. In particular, Andrew Feenberg (2002; 2017; 2018) argues that while power inequalities prevail in the use and design of technology, democratic interventions, which are defined as "the actions of citizens involved in conflicts over technology," (Feenberg 2017b, p.53) are possible. Under the critical theory of technology, or critical constructivism, Feenberg (2017b) re-negotiates the ideas of the Frankfurt School and brings in the formulations from social constructivism to consider the democratic potential of public interventions and participation in the processes of technological design. Considering that technology is similar to legislation and has the power to structure our everyday existence (Winner, 1992), actions that we are able or not

able to take in the technical domain have political consequences and the direct effect on our lives and rights. In this sense, Feenberg suggests that in the technical domain, the issues that are often portrayed as exclusively reserved for experts with legitimate technical experience and knowledge, are in fact also a matter of public interest and democractic participation.

The critical theory of technology therefore conceptualizes technology as a site where the public can enact resistance against the monopoly of knowledge and influence wider political developments. Feenberg (2017a) refers to those democratic acts as the acts of 'technical citizenship'. While not possessing the specialized knowledge of the experts, the public owns "knowledge from below" that is based on their own experience with a specific technology, including its harmful effects (Feenberg 2011, p. 3). By intervening into unfair and oppressive technical processes of design and implementation from the bottom-up and realizing their visions of technological design, citizens create more inclusive, democratic, and socially just forms of technologies (Feenberg, 2002; Feenberg, 2017a). The study of environmental and social movements, such as anti-nuclear and anti-highway movements (Hess, 2007a), demonstrate how public interventions into the processes of technological development succeeded in consequently changing the design and regulations of specific technologies. Moreover, the evolution of the network society led to a further decline in expert authority and to "a new kind of technical micropolitics that enhanced the established technical systems while subverting their original design" (Feenberg 2017a, p.101). Open data initiatives belong to the later kind of technical micropolitics.

The civil-led open data initiatives in Ukraine aim to change the way the system of information production works. Civil society and other social actors do so by pushing for the publication of government data and engaging in the configuration of open data infrastructures, further democratizing the processes of knowledge production and technological design. The presence of open data in turn allows for the development of tools and services aimed at improving the transparency and enhancing democratic participation. Considering the presence of power inequalities and institutional barriers in Ukraine, the impact of open data initiatives still requires a critical examination with the acknowledgment of the country's distinct socio-political conditions. Since open data involves multiple groups of social actors, both from public and private sectors, practices

of technical citizenship are not homogenous and are determined by different interpretations of the role of open data and political interests in its uses. In the following section, I elaborate further on my application of the concept of 'technical citizenship'. I also refer to the ideas of 'boundary object' and 'spaces of convergence' to consider the multifaceted and contingent dynamics of a new space formed by the institutionalization of open data. I will then provide my conceptualization of the Ukrainian open data movement and present the research questions.

2.5. Bridging Theoretical Perspectives

The institutionalization of open data in Ukraine initiated the formation of a network of social actors, who have come from different sectors and fields of specialization and are now engaging in new ways of collaboration and interaction around open data. While it is tempting to state that open data is creating a uniform positive impact across various fields, the reality is that the heterogeneous nature of the movement produces different forms of potentialities and tensions manifested both in existing power structures and the interpretative flexibility of social actors. In this respect, I see the strength of STS, and specifically SCOT, in acknowledging the importance of examining social aspects of technological development on the ground level and in relation to concrete examples of interactions. It is by disentangling the elements of seemingly coherent and logical socio-technical systems that specific points of tensions between the status quo regime and alternative visions of democracy can be identified. Feenberg (2002, p.15) refers to those points of tensions as "the realization of an interest or ideology in a technically coherent solution to a problem" or a technical code. The technical code can be manifested on the most basic micro level, such as an individual database, that reveal much broader political rationalities of groups that designed it. In the STS field, Bowker and Star (1999, p.34) conceptually capture this relationship under the notion of infrastructural inversion - "the interdependence of technical networks and standards, on the one hand, and the real work of politics and knowledge production on the other." SCOT's empirical approach allows one to examine this structural relationship and unpack the data assemblage (Kitchin and Lauriault, 2014) of the open data movement by tracing the process of generation of the technical codes and detecting potential points where democratic interventions can take place. The insights from critical communication scholarship add both philosophical and normative dimensions to my empirically informed research.

Before explicating my central formulation, I would like to contextualize the concepts of boundary object (Star & Griesemer, 1989) and spaces of convergence (Chow-White & Garcia-Sancho, 2011) in relation to my research. Both concepts add the spatial dimension to my formulation and provide explanations on how social actors, while occupying different disciplinary fields and possessing different forms of knowledge on open data, are interacting and collaborating to enact technical citizenship. Susan Leigh Star and James R. Griesemer (1989) refer to the concept of boundary object to describe the objects that bring together multiple social worlds with their own distinct identities to interact and collaborate.

> Boundary objects are objects which are both plastic enough to adapt to local needs and the constraints of the several parties employing them, yet robust enough to maintain a common identity across sites (Star & Griesemer, 1989, p. 393)

Star and Griesemer developed the concept to analyze how specific objects, whether material or abstract, act as translation devices to maintain both the coherence and flexibility across diverse communities (Huvila et al., 2016). Communication practices, interactions, and collaborations are centred around those boundary objects, which by inhabiting several intersecting social worlds hold various meanings to different actors and are simultaneously endowed with a shared meaning so it would be recognizable in an interdisciplinary manner across the sites (Star & Griesemer, 1989).

> When necessary, the object is worked on by local groups who maintain its vaguer identity as a common object, while making it more specific, more tailored to local use within a social world, and therefore useful for work that is NOT interdisciplinary. (Star, 2010)

In relation to the open data movement, formulations on boundary objects extend the notion of the interpretative flexibility (Star, 2010) into a space dimension, therefore highlighting

the fact that social actors, while determining the meaning and the use of open data, also occupy specific positions within different fields. In this sense, social actors are mobile in "tacking back-and-forth" (Star, 2010, p.605) between "universal" interdisciplinary and more specific localized meanings of open data. While the interdisciplinary meaning of open data is defined by various international open data standards, such as the International Open Data Charter, the localized meanings are dependent on the specific discipline and field of work that social actors comes from, as well as Ukraine's distinct context.

The concept of the spaces of convergence (Chow-White & Garcia-Sancho, 2011) is informed by the formulations of the scholars from critical communication, media studies, and political science. It explicates the dynamics that result from the convergence of different disciplines and practical fields. According to Chow-White and Garcia Sancho (2011, p.130) spaces of convergence are "the spaces of flows of people, disciplinary expertise, finance, cultural values, institutional ethics, technology, information, data and code". The space of convergence that has formed around open data as a boundary object brings together an intersectoral community from the government, public, and private sectors. Each sector or field has its distinct values, norms, rationalities, and social goals that impact the way social actors interpret the meaning and use of open data within the Ukrainian context. In the process of convergence and interaction with open data, those fields change too. "Convergence is not an end product or the marriage or fixed relationship," (Chow-White & Garcia-Sancho 2011 p. 129) but instead is a process unfolding over time and space characterized by both the tendencies for unification and dynamic tension. Building on this formulation, the acts of technical citizenship around open data, to a certain extent, are shaped by distinct qualities of the fields from which social actors come from. In the process of working with open data, social actors are also redefining their own fields of specialization. For instance, while the field of investigative journalism shapes the use of open data in relation to anti-corruption issues, the data-driven and analytical characteristics of open data are simultaneously contributing to the development of data journalism in Ukraine. In my further examination of open data initiatives, I will therefore consider these mutually constituting trends.

In the context of the aforementioned formulations, I conceptualize the open data movement as a socio-technical space of convergence that emerged as the result of

institutionalization of open data in Ukraine. The space brings together various social actors in a novel form of collaboration and interactions. By collectively shaping and re-configuring the infrastructures of open data, social actors aim to enact alternative visions of democracy and civil participation from within the socio-technical domain. In the process of doing so, they engage in the acts of technical citizenship. Since the open data movement is still nascent and evolving, there is a gap in both the academic literature and in mainstream media in providing a systematic and detailed overview of the movement. Therefore, in addition, to conducting a critical examination of the open data movement, the goal of my research is also to address this gap. The research questions for my thesis are:

RQ1.1 Who are the main social actors currently shaping the Open Data movement in Ukraine?
RQ1.2 What are the main challenges, achievements, and goals of the movement as defined by those social actors?

RQ2: How can we understand the development of the movement and its impact in relation to the localized interactions between social actors and the movement's embeddedness in the broader socio-political structures and geopolitical situation of the region?

RQ3: To what extent does the movement contribute to the social change and reform in Ukraine?

The following chapters will explore these questions in relation to the presented theoretical framework. Chapter Four follows the methodological suggestions of STS and focuses on the micro/meso level interactions between social actors and the role of their interpretative flexibility in shaping the meaning and uses of open data. Chapter Five moves from concrete examples to the analysis of broader themes, discussing the extent to which Ukraine's political situation has impacted the dynamics of open data. I now refer to the Methodology Chapter to outline the design of my research study.

Chapter 3.
Methodology

3.1. Introduction

My interest in open data started around the time when Ukraine was undergoing political changes following the end of the revolution. I was curious to learn more about new civil initiatives and reforms that were taking place in my home country. Open data initiatives and projects were among new civil-led developments that seemed promising but also rarely analyzed in relation to Ukraine's distinct political and social transformations. The early media coverage on the topic was both scattered and scarce and mostly provided brief summaries of initiatives without going too much into details (Fundacja ePaństwo, 2015; Duhaney, 2016). Since the open data movement was still nascent, I found no official accounts, which would offer a systematic overview of the existing open data projects, social actors involved, and the assessment on their progress and achievements. By choosing this particular research topic one of my goals was therefore to address the existing gap in academic literature and media accounts. My second goal was to examine a new form of political agency, which was emerging following the end of the revolution and after the institutionalization of open data.

While forming my methodological approach, I relied on the theoretical formulations of the critical scholarship in communication and technology and methodological suggestions from the STS with a goal to unpack the data assemblage of the open data movement (Kitchin & Lauriault, 2014). I chose semi-structured interviews as a research method to gain insights directly from Ukrainian individuals and organizations from the open data community. I designed my research study in a way, which would allow me to gain new insights on the impact of power structures and the role of individual social actors in shaping the dynamics of the Ukrainian movement. Upon receiving the approval of the research protocol from the Office of Research Ethics (ORE) under file 2017s0049 on April 2017, I organized a one-month field trip to Ukraine from May to June 2017 to meet face-to-face with individuals working with open data from government, public, and private sectors in Ukraine's capital Kyiv. In the following sections I describe the stages of my study design, data collection, and data analysis.

3.2. Choosing a methodological approach.

Semi-structured interviews involve both predefined and open-ended questions. The choice of this particular method was made with the rationale that a semi-structured form will allow to systematically gather data about a set of central topics, while still giving interview participants space to narrate their experiences (Galleta and Cross, 2013) and share new knowledge (Wilson, 2013). Other researchers have also previously employed semi-structured interviews in their case studies on open data to gain more detailed and experience-based insights (Janssen et al., 2012; Dawes et al., 2016). For example, Dawes et al. (2016), who conducted a comparative study of open data programs in St. Petersburg and New York, geared interview questions to different types of respondents to better understand different perspectives of working with open data, problems encountered, and benefits generated.

In my own research study, I edited the protocol for each interview by including additional questions to account for the potential contribution of a specific interview participant with a consideration to his/her specialization and field of work. A more flexible structure of interviews gave space for participants to share additional information, whether on other social actors or salient issues in the open data space. As I conducted more interviews, I gained a better understanding of prominent aspects and topics to focus on and enquire about in the next interviews, such as technical challenges in publishing open government data or new partnerships between organizations. I therefore included those considerations in developing and improving my interview protocol, so the questions could be more specific as I progressed in my data collection process. Looking retrospectively, rather than constructing a predetermined structure into which to fit data, semi-structured interviews allowed me to frame my research as an evolving process, where the contours of the open data movement's network were co-constructed through the interactions between the researcher and interview participants.

Galleta and Cross (2013) note that semi-structured interviews allow for the application of theoretical constructs of specific disciplines. In this context, my interview questions reflect the approaches from STS and critical scholarship in technology and communication. In constructing my interview questions I followed Kitchin's and Lauriault's (2014) suggestion for charting and unpacking data assemblages, where data

assemblages “encompasse all of the technological, political, social and economic apparatuses and elements” (Kitchin and Lauriault, 2014, p.6) that guide the generation, the circulation, and the use of data. The interview questions aimed to explore different dimensions of data assemblage under four main themes: 1) open data in relation to the participant’s work and organization, 2) the participant’s understanding of the role of open data in Ukraine, 3) the technical dimension of open data, and 4) open data and the socio-political context of Ukraine.

The first part of my interview protocol included introductory questions that helped to build a rapport with the interview participants and learn more about their professional background, their organization, and previous and current work related to open data. These details also helped to gain a broader perspective about the field that respondents were coming from and how it may have possibly influenced the way they constructed meanings and rationalities around open data. The subsequent set of questions moved from the introductory questions to discussing broader themes. By relying on the STS concept of interpretative flexibility, I used direct, follow-up, and probing questions to address participant’s interpretations of open data’s role in the Ukrainian context and in relation to their work, such as information advocacy, journalistic investigations, and open data-driven entrepreneurship. The rationale was that the responses would provide more information on both how participants interpret the achievements, challenges, and goals of the open data movement from their position in specific fields and how those interpretations might have impacted the actual use of open data in their work. Overall, the second set of questions allowed analyzing both the process of social construction of open data by social actors and its actual use in various fields.

The design of the third set of questions was informed by the formulations from the critical theory of technology, which conceptualizes technical infrastructures as manifestations of broader social and political conditions. The questions focused on the technical aspects of the open data movement, such as published and unpublished databases, technical formats of open data, and the criteria for their quality, with the rationale that these technical elements act as technical codes (Feenberg, 2002) or sites where differences in ideological interests or conflicts are manifested and where the acts of agency can simultaneously take place. For instance, responses that interview participants give about the reasons for an absence of a certain open dataset, could

possibly give more insights about the broader implications of power imbalances and existing institutional barriers.

Finally, I designed the last set of questions to take into account the interrelation of the broader power structures and local open data initiatives. Questions addressed the role of Ukraine's geopolitical transition and the Revolution of Dignity and welcomed participants to share their thoughts on the impact of those events on the development of the open data movement. Considering that the responses could be politically sensitive, I included an option for being "off record" and partially "off record".

3.3. Data Collection: Insights and Challenges

The preliminary stage of my research project included the use of secondary sources, including online newspaper articles, blogs, websites of open data organizations, and official reports on open data (UNDP 2015). I also relied on complementary reports on the Ukrainian political situation after the revolution (Pishchikova and Ogryzko, 2014; Shveda & Park, 2016) and the state of technological development in the country (Make Your Mark, 2016; Ukraine Digital News, 2016). Secondary sources enabled me to learn more about the background story of the social movement before travelling to Ukraine and informed the process of constructing interview questions. It also helped me to identify organizations and individuals from different fields (private/public, government), who could be potential gatekeepers and interviewees for my project. Later during the stage of data analysis, I referred to secondary sources to complement the information given by interview participants.

Getting responses from potential respondents while staying in Canada was a challenge, since I was not working in the open data space and had a limited access to the Ukrainian open data community. I emailed potential leads using the contacts I found online, but did not get any replies. At the same time, sharing personal ties with Ukraine provided me with certain advantages. For the second round of email correspondence, I used my personal social media connections on LinkedIn and Facebook to find mutual contacts who could put me in touch with potential interviewees. I also designed a recruitment document, which included more details about my professional background, my research, the interview process, and the approval from the ORE. I sent out that

information to potential interviewees alongside with a brief introductory email. My goal was to increase the rate of response by emphasizing the reliability and academic goals of my project.

Upon the arrival to Ukraine I had several leads to contact, one interview arranged through my mutual contact, and another one organized through a LinkedIn connection. During the data collection stage, I used snowball sampling. This sampling method is a nonprobability and link-tracing sampling technique (Spreen, 1992) where existing study participants help the researcher to recruit future participants from their own social networks (Atkinson & Flint, 2001). In different studies across social sciences disciplines, snowball sampling is used when the researcher is trying to get access to and gain information from the 'hidden population' (Noy, 2008) or, in my case, a 'closed group', which was not as publicly visible and therefore more difficult to locate. Through the snowballing approach I gradually expanded my network to 10 interview participants. Overall, I have conducted 10 semi-structured interviews, 7 of them in person and 3 online with participants representing different sectors and fields in the open data movement (Table 1).

Table 1 Interview respondents according to their activities and fields of endeavor

Field	Organizations/Social Actors	Number of respondents
Government	government agency, intermediary organization implementing open data strategies on behalf of the government	2
Civil Society	nonprofit organizations, journalists, and open data activists	6
Startup community	startup, intermediary organization working with startups	2

Each interview lasted between one and one and half hour. I met respondents in public places, such as co-working spaces and cafes, in Ukraine's capital Kyiv. Meeting in public places did not require employers' official agreement, which sped up the process of interviewing. The semi-structured format of the interviews allowed participants to contribute their thoughts and experiences on the key themes addressed in the interview protocol, as well as to share information that might have not been covered by the interview questions. The interviews were conducted in Ukrainian, Russian and English, depending on each participant's language preference. Seven of the interviews were conducted in person and audio-recorded on the digital device.

I presented the informed consent document to the participants to sign before the interview and recorded their statement of consent before proceeding to interview questions. It is important to mention that my study took into the consideration participant's privacy and potential risks. The informed consent document outlined in details the measures that I was going to take to protect the privacy of the data collected. This included storing the recorded audios and interview transcriptions on a safe Canada-based server and deleting the audio records as soon as possible from the digital device. Since some of my questions indirectly touched upon broader political conditions and institutional arrangements in Ukraine, I was careful in considering the potential risks to the participants. In my interview protocol, I included an option for being 'off record', meaning that the interview would be used as background information with interviewee's information anonymized. While all interview respondents gave a consent to be 'on record' for most of the questions, in my analysis I took additional measures and anonymized specific responses, which I saw as potentially sensitive. In that case I only included a general description of the respondent's position or field of specialization (Table 2). It is also important to mention that some of the participants previously held job positions from other fields and, where relevant, were referenced according to their past roles.

Table 2 Attributes of Interview Participants

Participant	Job Description	Field Represented
1	Team leader	government

2	Member of the department	government
3	Open data, member of NGO	civil society
4	Open data activist, representative of an NGO, former journalist	civil society
5	Journalist and activist working with open data	civil society
6	Chairman of the board	civil society
7	Journalist working with open data	civil society
8	Project team leader	civil society
9	Co-founder of the civil tech organization	startup community
10	Team member	startup community

Upon my return to Canada, I also conducted three interviews online. I established contact with online participants through social media by relying on the references from previous interview respondents. After introducing my research project, I sent the ethical consent document and the document with interview questions to interview participants. Participants were explicitly asked to present their consent in the written form. While online interviews welcomed respondents to share additional insights and comments, they might have not provided the same level of personal interaction and flexibility that is usually present in the real-time setting. The replies were briefer and included less details than the interviews which were conducted in person. That being said, by the time I was conducting the interviews online, I had already gained a good understanding of the areas I wanted to address. Therefore, the questions I included in the protocol were specific and did not require participants to share more than they were asked.

Snowball sampling was an effective approach, which helped me to get in touch with the open data community, considering the limited access that I had to the community

and the one-month time constraint. At the same time, the approach has its own limitations. Asking references from interview participants meant that only the members from close social networks might have been referenced and interviews with participants holding different perspectives might have been missed (Browne, 2007). I aimed to address this limitation by relying on secondary sources to find additional information on organizations, social actors or initiatives, which were not mentioned during the interviews. In this sense, interviews also equipped me with more specific pointers to find additional online secondary sources about the movement.

3.4. Data Analysis

The objective of the data analysis stage was to draw insights, patterns, and themes from the obtained data. Upon my return to Canada, I spent two weeks transcribing the audio-recorded interviews with each interview resulting in around 3-8 pages. I saved each interview in a separate document and retained the transcripts in their original language (English, Russian, and Ukrainian). Later, I only translated quotes and extracts that I used in my analysis.

By the time I finished transcribing, I had an extensive amount of interview data to work with. The challenge was to find a systematic way of analyzing data, while keeping attention to both the scope and details of data. I followed the recommendations of both qualitative theorists and researchers in using a qualitative data analysis computer software to ease the process of the analysis (Berg, 2001; Denzin and Lincoln, 1998). I used a qualitative data analysis computer software package, NVivo 11, which allows for direct interaction directly interact with the interview data and use built-in tools to categorize and analyze the text within each document. I imported the transcribed interviews as word documents to Nvivo and coded the data by following the reiterative process of switching between deductive and inductive approaches. Research questions and four predetermined themes, which I used in my interview protocol, helped me to deductively code data by examining the themes and patterns across all the interview transcripts.

Due to the amount of details and insights that the interview participants shared, coding was also an iterative process of discovering new connections and generating new ideas within and between the interview documents. This aspect of coding was therefore

guided by the inductive approach. I went through each interview transcript and recorded newly discovered patterns under newly created themes, such as ‘open data governance’ or ‘anti-corruption’ initiatives. The final steps of the coding process involved checking for the repetition of thematic categories and merging them where necessary.

Considering the fact that my interview transcripts were in different languages, I made sure there was a consistency in the translation between conceptual categories used in my coding in English and concepts and terms used in the original interview transcripts in Russian and Ukrainian. I also used NVivo to categorize social actors and coded all individuals, groups of actors, and organizations mentioned in the interviews according to the field and sectors they represented: civil society, businesses and startups, government, and international organizations. These categorizations helped me to create a conceptual structure for further analysis of interactions in the open data space, which will be introduced in the next chapter.

In the next two chapters, I present the interview findings and analyze them by referring to the aforementioned theoretical framework. Chapter Four addresses RQ1.1 and RQ 1.2. By following the STS approach, I unpack and examine the data assemblage of the open data movement and present social actors in the open data space, the way they interact, and their involvement in interpretative flexibility to shape the meaning and uses of open data. The discussion in Chapter Five, which is informed by the critical scholarship on technology and communication, addresses RQ2 and RQ3 and builds on the interview findings to develop the analysis in relation to the broader themes of socio-political conditions and the geopolitical situation in Ukraine.

Chapter 4.
Unpacking the open data assemblage

4.1. Introduction

In this chapter, I carry out a critical examination of interactions taking place within the open data space. By relying on the STS concepts of relevant groups and interpretative flexibility, I analyze interview responses to examine the interactions of the social actors in relation to two overlapping aspects. The first one relates to social actors' interpretation of the role and use of open data in relation to their field of endeavour. My argument is that the way social actors interpret the role of open data has a tangible impact on the way open data develops and is implemented in Ukraine. The second aspect concerns the roles that different groups of actors take on specifically in the open data space in respect to the processes of 1) open data publication and regulation, 2) open data usage, and 3) data intermediation. By examining the interactions on a micro/meso level, my goal is to unpack the data assemblage (Kitchin & Lauriault, 2014) of the Ukrainian movement and conceptually map out the relations between groups of actors, existing open data initiatives, specific datasets, law, and institutions. Unpacking these assemblages enabled me to detect the points of tension or technical codes, represented by opposing visions of 'openness' and 'closeness' of the technological design and implementation of open data. As the interviews demonstrated, these points of tension also act as points of potentialities, where new forms of agency based on tactical actions and technical politics take place.

4.2. Examining Social Actors in the Open Data Space

The introduction of open data in Ukraine resulted in the formation of a new socio-technical space of convergence, which brought together social actors and groups from public and private sectors in a new form of interaction and collaboration. Interviews demonstrated that there are three main groups directly working on different aspects of open data: the government, consisting of various local and national entities, civil society, which includes individual activists, journalists, and nonprofit organizations, and the startup community.

Table 3 Social Actor Groups

Social Actor Groups	Social Actors
Government	Ukrainian Government, government ministries, State Agency for E-Governance, municipal government
Civil Society	nonprofit organizations, journalists, open data advocates, individual activists
Startup Community	Individual startups, intermediary organizations working with startups

While all three of those groups have a common understanding of open data defined by international principles and national laws, they also articulate 'localized' meanings of open data that is shaped by what Bourdieu (2011) referred to as habitus, or habits, skills, and dispositions that social actors possess by occupying specific disciplinary fields. Open data therefore acts as a boundary object (Star & Griesemer, 1989), which unites social actors across the fields, but, at the same time, mediates their flexibility in defining the use of open data according to their professional goals and interests. Interviews also indicated that social actors articulate and organize their work in relation to distinct open data processes, including data publication, data usage, and data intermediation. Data publication refers to "a mixture of operational requirements, resources, and activities to prepare and publish data for public use." (Dawes et al., 2016, p.18) The processes may also include activities related to defining governance and legal frameworks, data standards, and formats. Data usage includes the activities by social actors from government, public or private sectors of searching, identifying, and downloading open government data for a variety of purposes, such as analysis and visualization or further development of tools (Dawes et al., 2016). Data intermediation, which defines the activity of social actors who facilitate use and reuse of data, has recently

been recognized by researchers as an important activity ensuring the functionality of other open data processes (Reilly & Alperin, 2016). Simply publishing open data and complying with technical standards is not enough to facilitate the meaningful use of open data in the society. Actors taking part in data intermediation provide an important enabling function by acting as mediators and bridging institutional boundaries. They address existing gaps within the open data processes, offer solutions, and create communication channels between different actors (Schalkwyk et al., 2016).

According to the ecosystem model, all three of these processes ensure the effective functioning of open data. An ecosystem model is frequently used in impact assessment studies and general case studies in the areas of open government and open data (Harrison et al., 2012; Schalkwyk et al., 2016). While discussing their work, interview participants directly referred to the model and its process components to describe their work. The model refers to a system of mutual institutional and stakeholder interdependencies (Harrison et al., 2012) where the value of open data is created by mobilizing social, political, and technical resources to ensure the effective 'supply' and 'demand' of open data. This means that supply, which is represented by publication of open data, corresponds to demand, or extent to which certain government datasets are sought-after. The official documents that guide Ukraine's implementation of open data are based on the ecosystem model, including the Open Data Readiness Assessment report prepared by United Nations Development Program (2015). The ecosystem model provides both a normative and practical framework for social actors to follow while working with open data in Ukraine.

By relying on the classifications of the ecosystem model without necessarily applying it to my work, I will discuss the interactions of groups of social actors in relation to the processes of: 1) data publication and regulation, 2) usage of open data, and 3) intermediation of open data. This will be done with the acknowledgement of the ecosystem model's limitations as discussed by the academic literature. The model's focus on reaching equilibrium of constitutive parts does not consider conflicting perspectives existing among various social groups and the conditions of economic, social, and cultural power imbalances in which those groups operate (Schalkwyk et al., 2016; Reilly & Alperin, 2016). Instead, in my analysis I will frame these processes in relation to institutional structures and power dynamics in Ukraine.

4.2.1. Data Governance and Publication.

For open government data to be available for publication and use, the government should outline legal frameworks to define open data governance and the technical aspects of providing data to the users. In 2015, the Ukrainian President and the Cabinet of Ministers issued two important legislative changes – a newly amended Law on Access to Public Information and the Decree 835 – which set the open data movement in motion (Kovalchuk et al 2018). This was a significant breakthrough for Ukraine and its path to reform, since various efforts by activists to push for openness of government data existed before the Revolution, but did not succeed. Before the introduction of the law, social actors had to send requests to the government to receive the information, which often came incomplete, with delay, or in a wrong format (Gazin, 2015). The amendments made to the Law on Access to Public Information now required all government agencies owning the public information to provide it in the form of open data – structured data that is machine readable, interoperable across different programs and systems, freely shared, and used without restrictions regardless of whether it is for commercial or public interests (Open Knowledge International, 2018). Government agencies were expected to publish and update their databases on the regular basis both on the national open data portal and their own websites. The Decree 835 specified the list of over 300 datasets to be published, the means by which it will be done, and the technical aspects of data, such as their format and structure (Kovalchuk et al., 2018). In 2017 the State Agency for E-Governance drafted amendments to the decree, doubling the list of datasets to be opened over the next few years starting in 2018 (ibid). The legislative changes resulted in the publication of important datasets, such as the data on public procurement and the asset declarations by civil servants (ibid), which helped the civil society in their anti-corruption investigations and creation of new public services and tools. Citizens were now able to access data without going through lengthy administrative processes.

Discussing these events with the respondents resulted in an interesting finding. Throughout the initial stages of the movement, Ukrainian non-profit organizations played an active role in assisting with the drafting of the Open Data Law. The activists from Social Boost, a civic tech organization, also developed a demo version of the national open data portal as a part of their advocacy for the institutionalization of open data. It was later

passed on with modifications to the State Agency of E-governance, a government body that regulates and develops electronic government services. The portal is currently used by every major government institution to process and publish their data in the open format.

This finding raises questions on factors, which enabled the civil society to be actively involved, since this group is often excluded from government's decision-making processes. Two interviewees mentioned that the key factors, which enabled this to happen, were the greater commitment of politicians to accountability and transparency after the revolution, civil society's technical skills in working with open data, and their access to the relevant social networks. The co-founder of Social Boost, Viktor Gursky, commented:

> *On one hand, it is quite upsetting that the government does not have the expertise in this area, but on other hand, it opens a lot of opportunities for the tech specialists to fill in the gap... A lot of things that our civil society and activists do, governments do by themselves in other countries.*

One of the reasons civil society was able to take part in the institutionalization of open data is that work with data requires specific technical skills and knowledge that government officials might not have possessed. The technical nature of the open data space therefore contributed to a change in the dynamics of the relations between the government and other social actors. The tech savvy members of the civil society are gaining a greater access to governance procedures and are able to contribute to the country's reform through their ability to operate in technological and data-driven fields. Bourdieu's concept of cultural capital is particularly relevant in explaining the situation. According to Bourdieu (2011), cultural capital is an accumulation of knowledge and experience that gives social actors possessing it an advantage and greater power in a specific disciplinary/social space governed by specific rules and principles of behaviour (Bourdieu, 2011). The cultural capital defined by the civic tech activists' ability to work with open data gave them an advantage over state actors, for whom the concept of 'open data' itself was novel. This advantage provided the activists with the opportunity to enter the field of governance and shape the course of development of the open data reform. That being said, with a newly obtained agency the activists still faced structural constraints in

their work. For instance, a respondent working with open data in the government noted that the demo version of the national open data portal designed by civil tech activists was significantly modified once it was passed on to the Ukrainian government. However, additional research is required to specify the exact technical changes made to the portal and the implications of those changes.

Interviewees also demonstrated that the social capital owned by some members of civil society played an important role in enabling the activists to access the influential political circle and initiate the open data reform in the first place. Bourdieu (2011, p.86) defines social capital as "the aggregate of the actual or potential resources," which are related to a possession of a durable network of institutionalized relationships and allows one to achieve a certain instrumental goal. Several interview participants mentioned that Social Boost had the access to a relevant political network, which allowed its members to gain support from high-profile politicians and the technical and financial support to create a demo version of the open data portal. One of the respondents commented:

> *[Open Data movement] was made possible since the new government and new president were elected. The former CEO of Microsoft Ukraine started working as the deputy head of the Presidential Administration of Ukraine. His work, as I understood, involves the promotion of the legislative bills. In the past, Microsoft supported the projects of Social Boost and I think it was with the support of the deputy head that many legal decisions were made.*

The co-founder of Social Boost himself noted the support from the Presidential Administration and Microsoft, but also how civil advocacy work enabled the movement:

> *"Our key partner, Microsoft… supported the open data reform and the introduction of the law. But there were also other people in the government involved to make it happen. They carried out advocacy campaigns (we don't call it lobbying, because lobbying is not legislated in Ukraine). We had to promote it among the public, so it would be introduced."*

Another interview participant from civil society confirmed that the advocacy work organized by international experts and other civil society members was impactful in helping to initiate the open data reform. The respondent mentioned that a collaborative civil society group actively took part in initiating open data in Ukraine. Its members conducted research on international case studies, created a list of prioritized datasets to be published, and advanced the idea of opening data among government officials and public bodies.

Based on the interview responses, a combination of factors contributed to the start of the open data movement. Civil society members took an active role in the initiation stages and, by relying on cultural and social capitals, were able to involve government representatives in starting the movement. These accounts add another dimension for understanding the dynamics of the institutionalization of the open data movement. The interviews shed light on seemingly straightforward and linear processes of the open data reform. They confirm the STS and critical communication formulations that the processes of defining technologies involve interests and goals of different social groups of actors, as well as negotiations and unconventional actions. They also provide an insight into the functioning of civil organizations and other social actors under the socio-political conditions of Ukraine. In Ukraine the institutional and inter-group relations are often established by private connections (Lutsevych et al., 2013, p.7). This explains the importance of the social capital in the work done by civil society members. Research conducted by the World Wide Web Foundation (Schalkwyk et al., 2015) on the impacts of open data in developing countries highlighted similar cases when social capital was employed by NGOs and other civil society members to raise awareness about open data led projects among the public and media outlets or gain access to close government datasets. In the absence of official institutional channels, such as lobbying, social actors often employ their social capital and reserve to tactical actions to reach their objectives.

With all of these nuances, the interviewees nevertheless emphasized that the open data movement initially started as a civic-led initiative and was later institutionalized by the Ukrainian government. The institutionalization of open data has opened up a space for various other social actors from diverse backgrounds to engage in realizing a new vision for Ukraine through the technical domain.

4.2.2 Data Use: Fighting Corruption and Building an Inclusive Economic Environment.

Two main social groups are currently the most active users of the open government data – the start-up community and civil society, comprising of investigative journalists, open data advocates, and non-profit organizations. Both social groups use government data to develop services and tools as well as carry out investigations and write stories for direct users or "the wider community [who] indirectly benefit from open data enabled products and services." (Kovalchuk et al., 2018, p. 10) While sharing a common understanding of open data principles, each of the groups also hold different localized interests in using open data. Interviews have also shown that externally, the existing bureaucratic systems and ineffective technical infrastructures act as barriers for both groups of social actors, but also incentivize them to find new tactical solutions to realize their goal of creating social change in Ukraine.

The Civil Society Group

Investigative journalists, activists, and NGOs mainly use open government data to ensure the accountability and transparency of public and governmental institutions, generate stories, and develop analytical tools to raise awareness about existing social issues. The civil society group is also the most engaged open government data user. They provide feedback to government institutions on the quality and accuracy of government data, advocate for the further disclosure of essential datasets, and make sure that government authorities do not remove published datasets or make any regressive changes in the legislative procedures. While the civil society group is diverse in its focus and goals, they articulate a broader role of enhancing transparency and accountability of public institutions, eradicating corruption, and finding solutions to existing social issues. Non-profit organizations, activists, and journalists from the civil society group have been working to realize those goals for a long time, even before the 2014 revolution. The institutionalization of open data provided them with a new space to carry on their work through engagement with both the technical and governance aspects of open data.

One of the questions I asked interview respondents was to name other social actors who they knew were working in the open data space. The results demonstrated that Ukraine has strong collaborative networks of NGOs currently working with open data.

Among them, Chesno is a civic organization that works on improving the quality of Ukrainian politics, provides critical evaluation and analysis on political activities, and monitors parliamentary elections. Opora, a civil network of activists, addresses issues on the control over local self-governing authorities, election observation, external independent testing, and advocacy for reforms. Eidos, an analytical and resource organization, researches and recommends changes to current legislation and regulation. Some of the organizations are directly involved in advocacy for the implementation of open data-related legislations and laws. For instance, thanks to the advocacy work done by Eidos, the Ukrainian government introduced the law "On the openness of the use of public funds", which requires the publication of open data on public finance and resulted in the creation of the first open source and open data public finance portal E-Data in Ukraine (spending.gov.ua, n.d). The portal is updated continuously with data available 24 hours, seven days a week. According to the interview respondent Alexandr Shchelokov, who is the team leader of the E-Data project, E-Data is currently the only portal that fully complies with the requirements of open data format in Ukraine. It provides the public with information on public budget and public funds, as well as analytics tools for increasing efficiency of spending. Vadym Hudyma, a representative of the civil society group, notes:

> *The anti corruption groups were the most organized and effective groups in the Ukrainian civil society, I would say. [Before the open data initiative] they already had a pretty good understanding of what datasets they needed, in what form, and where they could get it. They knew the exact steps they wanted to take.*

With a well defined mission and clear goals, civil organizations, journalists, and activists were able to carry on their ongoing advocacy efforts through new channels once open data was institutionalized in the country. The editor of the local investigative publication *Media Drogobichina*, Mariya Kulchitska, shared in the interview how her team was able to use open data to address corruption issues and monitor the municipal government's spending of public funds on projects, such as the repair of the roads and public procurement processes.

It was upsetting for us to find out that the low-quality work, which was done to repair the local roads, cost hundreds of thousands of UAH on paper. At the same time those findings motivated us to write and tell stories to the public. As the result, we observed the decrease in the tendency of misspending the public funds.

The availability of data on public finance has therefore created broader social changes by providing new channels for journalists and citizens to intervene into unfair political processes and combat corruption. For instance, Texty.org.ua, a data journalism platform and think tank, works extensively with the government data and open data to create interactive graphics and give larger audiences the opportunity to understand socio-political issues in the country. Among investigations carried out based on open government data was an interactive report on the progress of Decree 835 on "How Government Entities (did not) fulfill the Decree on Open Data". It provided infographics on the leaders among government entities in publishing open data and those who ignored the legislative order (Gazin & Shchurska, 2016).

The engagement of civil society with open data also reveals certain tensions. Texty's other collaborative project with the Ministry of Infrastructure on visualizing the data of the national railroad company Ukrzaliznitsia demonstrated broader challenges posed by the post-Soviet legacy. The head of Texty.org Roman Kulchinskiy mentioned (PAIC, 2018) how the Ministry of Infrastructure, which at the time was implementing open data reform in its institutions, offered Texty.org to publish and visualize several of the ministry's open datasets as a means to publicize the ministry's progress. Texty.org accepted the offer. The organization decided to focus on analyzing the data on the passengers of Ukrzailznitsia, a state-owned enterprise controlling a vast majority of railroad transportation in Ukraine, which was technically located under the control of the Ministry of Infrastructure. However, the process of obtaining the datasets from Ukrzaliznitsia proved to be complicated and took two months for the Ministry to complete. The interview respondent, who at the time worked at Texty.org.ua, noted that in the end the organization managed to publish the visualizations, but not the data:

The reason why the data was not published was because they did not belong to the Ministry and was owned by Ukrzaliznitsia – it is a state owned enterprise

(SOE). There was a conflict between the ministry and Ukrzaliznitsia, and they failed to reach agreement. The data are still not published, since the conflict is still going on.

This situation sheds light on the prominent legacy of the Soviet regime – state owned enterprises. Ukraine inherited around 3500 state owned enterprises (SOEs), or commercial companies owned by the state and assigned for the ownership to a specific ministry. Some of those SOEs, including Ukrzaliznitsia, are keeping highly important datasets, which cannot be published. Even though SOEs are technically under the subordination of ministries, they are not entirely government entities either and therefore are able to neglect the law. One of the respondent noted that the Ministry of Education faces the same situation with its centralized database of the higher education, which is controlled by another state-owned enterprise. As the result, the datasets that could be or would be open in other countries, such as datasets on infrastructure, public health, and energetics, are not currently widely accessible in Ukraine (Gazin, 2015). Ukraine's old political regime and highly centralized public sector controlled by the state and economic groups pose significant challenges to the publication and use of open data. The example of disagreement between the Ministry and the SOE relates to the broader issue of defining the meaning of publicly funded data and determining which datasets should be open or remain closed and with what consequences. As the open data movement is still in an early stage of interpretative flexibility, this question extends beyond this particular case with SOEs. Other social actors from civil society, the startup community, and government institutions are playing a prominent role in articulating and consequently shaping the openness of information.

The respondents from the civic group also pointed out other challenges related to the availability and quality of datasets. The presence of data on the open government portal does not necessarily mean that the data is open. When I asked them to assess the datasets currently published on the national open data portal, one of the journalists working with open data noted that among 1500-1600 datasets available on the national portal (Summer 2017), "only 10-12 were adequate" in terms of quality. The rest of the documents were not in the machine-readable format and instead either scanned or used in pdfs and word documents, which prevented any kind of meaningful analysis and use. The respondent from the government group, estimated that from those 1500-1600

datasets in Summer 2017, “only 5-10% are actually useable.” The reasons for the low quality of data are complex and diverse. They range from the aforementioned resistance of some government officials to publicize what they view as their own data to the lack of data literacy among government employees, the absence of labour and time resources, and the lack of funding for establishing technical infrastructures in the government institutions, where most of the information is stored in paper documents.

While the members of civil society cannot by themselves introduce institutional changes to the bureaucratic structures of the government or replace the outdated technical infrastructures, they employ available resources from the grassroot level to organize various initiatives aimed at improving data publication processes, therefore enhancing social actors’ experiences using data. They create communication channels to engage with government officials, actively send them feedback and requests for improving the available data on the portal, organize workshops, and create online education modules for government employees to improve their understanding of open data. By engaging in those activities, civil society takes an active part in redefining and improving the technical infrastructures of open data.

Among the notable initiatives that demonstrate the civil society’s tactical endeavour in changing the institutional arrangements was the volunteer-led digitization of the dataset on the asset of declarations published by the Ministry of Justice (Bihus.info, 2017). The dataset provided information on the asset declarations by government officials and allowed the public to learn about the income, source of income, real-estate, and other types of property, such as cryptocurrencies (Midrigan, 2018) that government officials owned. The problem with the initial datasets published by the government was that most of the documents on the website were scanned and handwritten. They did not correspond to the format requirements of open data and could not be automatically processed. To address the issue and make the asset declarations useable for a wider range of purposes, journalist Denis Bihus and his colleague programmer Dmitro Chaplinsky started the project Declarations in 2014. The goal of Declarations was to digitize the documents published by the government and based on newly re-configured data to create the portal with built-in analytics tools, rankings, and search tools (Bihus.info, 2017) for carrying out future investigations and obtaining new insights. Three thousand volunteers responded to the call through social media to participate in the project (Bihus.info, 2017). During the first

year of the project, the volunteers digitized almost 19,000 declarations and by the year 2017, the database held around 1.5 million declarations, making it the biggest open database of asset declarations of government officials in Ukraine. Based on the project the team has formed its own analytics centre that now uses open data to carry out investigations, assist other organizations in using the data, and develop new analytics models.

As demonstrated by the aforementioned example, the civic society group takes an active part in constructing the technical and social infrastructures to ensure that open government data is published according to the standards and can be used by other social actors to carry out new initiatives. In the light of existing structural challenges, they take on flexible and mobile roles, moving across disciplinary boundaries and areas of collaborations to overcome the existing structural barriers where they can and shape the meaning and use of open data as a reformative tool.

Startup - Community

The startup community is an emerging group of open government data users in Ukraine. Open data startups are working on the range of innovative tech solutions to address existing problems in areas, such as agriculture, transportation, and entrepreneurship. Members of the startup community see the role of open data in relation to economic development and technical innovation. Their articulation of open data's role can be better understood in the context of Ukraine's economy, which is characterized by the domination of key sectors and industries by vested interests (Graham et al., 2017) and their close links to the political sphere. The emergence of the open data startup community contributes to the technological innovation in the centralized and inefficient sectors, but also creates diversity by bringing in smaller companies with innovative solutions as economic players. In this section I examine how startups, while following the market-driven model, also perform the role of civic tech actors by creating innovative solutions in the public and governance sectors.

Following the 2014 Revolution, the tech-minded activists who participated in Maidan events, continued with political activities by pursuing civic entrepreneurship and activism in the technological domain (IT Ukraine, 2016, p.17). Open data provided a new

space for tech experts to utilize their knowledge and skills for social causes. A respondent from the start-up community commented:

> *[After the Revolution] people started realizing it is not always okay to work in outsourcing. They are creating new products for other countries, they receive high salaries, but when they come back home they realize that they are still in that same country. So they want to do something to change that. A lot of [tech-led] initiatives actually started emerging after Maidan.*

Ukraine has a growing number of highly educated IT talent with 100, 000 specialists in 2016 and the number is expected to double by 2020 (IT Ukraine, 2016). But despite the promising potential, most of the country's tech talent works in international outsourcing jobs – Ukraine is ranked as as the first outsourcing country according to various sources, including *Outsourcing Journal*, Colliers International, and Central and Eastern European Outsourcing Association (IT Ukraine, 2016). As the respondent mentioned, the idea of contributing to the development of the country through technological innovation is a discourse which became especially prominent after the revolution and reflects a broader change in the culture of civil awareness in the Ukrainian society. Those individuals who choose to enter the startup community, however, face structural challenges navigating in the economically unstable environment that is dominated by large state-owned and private enterprises and is characterized by the lack of legal protection and investment. According to the report on Digital Entrepreneurship (Make Your Mark, 2016), of 200 successful startups launched each year in Ukraine, only 60 startups manage to secure funding without going abroad, and out of those 60, only one or two are able to scale up and become successful "star" companies. A co-founder of Open Data Incubator 1991, a non commercial incubator supporting open data startups in Ukraine, Viktor Gursky, explains:

> *Nobody is investing into early startups. There is no such a thing as a startup in the Ukrainian laws. A startup is not a limited liability company, it cannot be defined under the category of private entrepreneurs. It is something else and the government should realize that… The fact is that there is talent in Ukraine and*

there are investors, who are interested in investing in them, but there are no legal frameworks to ensure the security of investments.

In the light of existing challenges, open data startups often require financial and administrative help to launch services and tools based on open data. Incubator 1991, alongside with other intermediary organizations, provide the required support. Incubator 1991 offers training and consultations, long-term mentorship, and support in fundraising activities, finding investors, and negotiations with the government, especially when the approval for the projects are required. Participants of the incubator develop tech products and services for the sectors that are prioritized on the national reform agenda - the public administration sector, energetics, infrastructure, and agriculture among others. Among the successful open data based startups that have emerged as the result of incubator program is Agri Eye (now renamed as Smart Farming). It is an agritech startup which uses open government data alongside innovative use of mapping technologies and drones with multispectral cameras to develop accessible tech solutions for farmers to analyze soil contents and determine whether and on which part of the land the fertilizers are required. By developing the tool, Agri Eye helps to partially address an issue of inefficient usage of land in the agricultural sector. While Ukraine is famous for its fertile black soil, the average productivity remains lower than in other European countries with less productive resources due to various factors, including the inefficient control of the land by the state (Strubenhoff, 2016). Agri Eye helps farmers to save up to 30% of land farming costs by effectively allocating resources (“Ukrainian agritech startup Agri Eye”, 2016).

Another prominent startup that developed independently from the incubator program and was mentioned by seventy percent of interviewees is Open Data Bot. The startup developed a multi-platform app, available on Skype, Telegram, Facebook Messenger, and Viber that protects entrepreneurs from corporate raiding or seizing of one’s property through unconventional means, including the manipulation the legal system (Rojansky, 2014). Corporate raiding is a prevalent problem in Ukraine due to weak property rights protections and legal system (Rojansky, 2014). Open Data Bot also provides citizens, lawyers, investigators, and individual entrepreneurs with tools for a more effective decision-making by screening open datasets on companies and individual entrepreneurs, court decisions, and hearing about companies from the Ministry of Justice.

Nikita Podgainiy, the lawyer at Open Data Bot, mentioned in the interview that the app is now widely used by entrepreneurs, lawyers, activists, and journalists. At the end of 2017, it had 50,000 daily users with subscriptions growing at a 10% rate each month.

Based on the examples above, it can be suggested that some open data startups, while pursuing market-oriented activities, contribute to the realization of reforms by developing tools and services for addressing issues that are prioritized on the reform agenda. In doing so they function according to the conceptual framework described by David Hess (2007b) as 'alternative pathways'. In his work Hess (2007b) explores, through the lenses of STS, the way social movements and other forms of activism are affecting technological development. He observed that under the conditions of globalization and capitalism, new forms of social actions emerged that aim to create new changes by offering alternatives in existing gaps from within socio-political systems. Alternative pathways therefore do not meet the strict definition of social movements and can exhibit "complex mixes of social change goals with goals of profitability." (Hess 2007, p.4) Within the Ukrainian context, the introduction of open data created a new market amidst a mostly centralized post-Soviet economy. This opened up new channels for open data startups to create innovative services and goods to address prevalent social issues. While social actors might pursue different local interests in working with open data, such as the generation of profit, their initiatives also address existing political and social problems by providing alternative solutions for monitoring and addressing inefficiencies and bureaucracy in the governance systems and public services. For instance, Agri Eye aims to innovate and boost productivity of one of the key sectors in Ukraine. Open Data Bot helps to reduce the information asymmetry, raises awareness about cases of corruption or corporate raiding attacks, and enables social actors to act in a timely manner. According to a member of the Open Data Bot team, the startup also engages in civil-oriented activities and takes an active part in enhancing the processes of open data publication, organizing workshops on open data, and sending daily requests to government officials to correct inaccuracies in their data. In this sense, open data startups, while functioning on the business model, also engage in the acts of technical citizenship by enhancing other social actors' ability to engage with open data infrastructures.

Open data startups can also indirectly encourage the government to pay attention to startups in general, and create favourable regulatory frameworks for them to function

and to contribute to Ukraine's economy. The respondent from Incubator 1991 noted that with the ongoing war and economic problems, the reforms in other areas, such as the pension system and healthcare, would be predictably higher on the list of priorities, "but not necessarily the startup reform". The success of open data projects can demonstrate the value of Ukrainian startups in the economic development of the country and encourage the government to introduce favourable regulatory frameworks to support their growth. The international think-tank Carnegie Endowment for International Peace (Jarabik & De Waal, 2018) stated that the biggest constraint on the economic growth in Ukraine is low investment. With regulatory and governance systems in place, there will be higher chances for small companies and startups to attract both domestic and foreign investment (Jarabik & De Waal, 2018). The development of new open data startups, along with small and medium sized companies, contributes to the emergence of a more diverse and innovative network of economic actors in Ukraine's currently centralized and controlled economy.

Similar to civil society, the startup community also faces challenges with the availability of open government datasets. They often address these barriers by employing tactical actions. Most of the useable datasets that are available in the open format, such as the registry of companies and VAT payers, mostly enable to carry out anti-corruption activities. A whole series of other datasets on infrastructure, transportation, public health, and education, which could be used to create diverse products and services, remain closed due to the legacy of the state owned enterprises, other bureaucratic procedures, and technical issues. Startups therefore often have to find ways to get access to "closed" government data. Some of them generate their own data, such as in the case of the incubator's graduate startup Navizor, a mobile phone app that shows the conditions of the roads for drivers to optimize their route, save fuel, and save their vehicles from damage. Without access to the data on road conditions, Navizor approached the task creatively by crowdsourcing the data from thousands of users using the accelerometer and gyroscope and estimating how much one's smartphone shakes when the users drive. The data was then aggregated and built into the open source/open data map of the quality of the roads based on the shaking movements of the users' phones. This case demonstrates that in the situations when institutional structures and technical issues pose challenges, the startup community engages in the tactical acts to create their own open data infrastructures.

4.2.3. Data Intermediation: Building a Bridge to Collaboration.

Interviews have shown that certain organizations from the civil society group also play a leading role as intermediaries. Open data intermediaries are highly flexible and mobile in moving across different fields within the open data space and taking on the role of facilitators to create the infrastructures for communication and collective action within the open data space. In the process of doing so, they play an active role in guiding social actors and contributing to their effective use and implementation of open data. Approaching open data as a boundary object (Star & Griesemer 1989), data intermediaries work on shaping the meaning of this boundary object by traversing the disciplinary and field boundaries and enhancing the understanding of open data's universal principles across different groups of social actors. They simultaneously help each group to enhance their engagement with open data based on the localized needs of its members and their professional specialization. In this way, data intermediaries help to keep the open data space both coherent and flexible across the existing perceptual and practical differences (Star & Griesemer, 1989).

In the context of Ukraine, the mobility of social actors in taking up the roles as data users, data intermediaries, and, in some case, data publishers, can be explained by the following factors. The open data community in Ukraine is still forming. The cultural capital required to work with open data is therefore concentrated within a close-knitted circle of social actors. Talking with interviewees about their professional path further demonstrated this trend. One of the interview respondents moved from working with open data in the government entity to joining a team in an international non-profit organization working on the implementation of open data initiatives in Ukraine. Other interview participants, who have an educational background in arts and humanities, eventually moved into the space of open data to work in open data advocacy, policy-making, and data analytics and hold various roles in the local and international non-profit organizations. Social actors therefore constantly transverse the boundaries within the space of convergence and take on several roles in order to perform their tasks and find innovative solutions to the existing structural challenges.

As the interviews demonstrated, the non-profit and civic organizations are currently taking the most active roles as intermediaries, filling in the roles, which are usually carried

out by the government and equipping other social actors with knowledge and skills required to work with open data. The aforementioned Texty.org.ua assists government officials with the implementation of open data and improvement of its quality. Among initiatives organized was a workshop conducted for the Ministry of Infrastructure and the creation of the open data guidebook that is currently used by all government officials registering to the national open data portal. Civic organization Opora works on stimulating the demand for open data on the municipal level, while the Ukrainian Centre for Social Data works on strengthening the regional leadership in open data. Since the average level of data literacy among the journalist community is still low, as a respondent working in investigative journalism noted, E-Data addresses the situation by organizing workshops and the national competition E-Investigations to encourage more open data-based activities in the area of investigative journalism. The startup Open Data Bot, aside from developing its products, takes an active part in open data advocacy and education. The company also organizes workshops for journalists and activists and have created and currently manages a Facebook group for exchanging advice and experience in finding data for journalism stories, sending data requests to government bodies, and technical aspects of working with open data.

Aside from individual civic organizations, Transparency and Accountability in Public Administration and Services (TAPAS) is a major intermediary organization, which works on the national level to implement open data initiatives. Founded and financed by several international organizations, TAPAS is a five-year project with the mission to support Ukrainian citizens and the government of Ukraine to reduce and eliminate corruption in public administration. With open data as one of its sub-directions, TAPAS collaborates with various civil society partners, including Incubator 1991, Social Boost, and Text.org.ua and covers most of the areas in open data activities that are usually carried out by the government. In the interview, the leader of Open Data team in TAPAS, Kateryna Onyiliogwu, gave a broader overview of the strategic vision of the Ukrainian movement and the way TAPAS facilitates communication and collaboration in the open data community in relation to this vision. Onyiliogwu explained that TAPAS directly helps Ukraine's State Agency of E-governance "with their vision and politics". While the agency sets the direction, TAPAS helps them to implement their vision. In its work the organization pays a special attention to the importance of contribution by each group of social actors on the overall impact of the movement and therefore directs its effort on maximizing the

individual impact and collaborative efforts. As one of the respondent currently collaborating with TAPAS noted, since TAPAS was launched in Ukraine, open data initiatives became significantly more coordinated. He described how the project helped social actors from different groups to communicate more effectively and be aware of the type of work that other groups are working on, so there would be no same initiatives happening separately and at the same time. He added:

> *That almost happened in 2016 when several initiatives aimed at training government officials were about to happen without any communication or coordination between them. Now if anyone wants to start an initiative, others would be able exchange contacts or join efforts so all the stakeholders will get the value out of the initiative.*

The work done so far in the intermediation of open data in Ukraine emphasizes the importance of organizations that position themselves in between the open data processes to increase the impact of open data. Ukraine's open data community is still relatively small and evolving. Social actors, mostly from civic society, therefore take on several roles to address the existing gaps in open data processes and work on building the infrastructure for coordinated actions and communication. The challenges that intermediaries address highlight the fact that there is currently a gap between the definition and standards of open data as outlined by international open data organizations, such as the International Open Data Charter and Open Data Barometer, and the local application of open data that is continuously influenced by institutional factors and technical conditions. Intermediaries therefore have an important task in balancing the tension between 'universal' and 'local' aspects and maximize the impact of the open data within Ukraine's socio-political reality.

4.3. Conclusion

This chapter presented the key groups of social actors currently shaping the open data space in relation to their participation in the processes of open data publication and regulation, the usage of open data, and data intermediation. In exploring those aspects, I followed the suggestion made by scholars of critical data studies in unpacking the data

assemblage of the open data initiative and analyzing existing connections between social actors, government/public institutions, and technical infrastructures. My goal was to uncover the points of tension, where power relations are manifested and democratic interventions take place. In doing so, I referred to SCOT concepts of relevant groups and interpretative flexibility to analyze the responses from interview participants. I subsequently focused on the way each group of social actors represented by the respondents shaped the meaning and use of open data based on two factors: their field of endeavour and their role in open data processes.

The analysis has demonstrated that while social actors each come from distinct professional backgrounds, such as entrepreneurship or investigative journalism, they all see open data as a space for enacting post-revolutionary reforms and creating social impact. The open data space therefore has emerged as a new socio-technical space, where the vision of 'new Ukraine' is enacted through the technical form of politics or technical citizenship. The institutionalization of open data with the help of civil society members stood out as a significant achievement. The interview findings showed examples of impactful open data initiatives and the prominent role of the civil society in initiating the first steps of the open data movement. Sixty percent of interview participants directly mentioned the presence of impactful open data services and tools developed by the civil society and the startup community as one of the main achievements of the movement. That being said, social actors also faced technical and, more prominently, political structural barriers, such as corruption and bureaucracy, which ninety percent of respondents mentioned as a challenge. Among salient examples of the later is the case with the state owned enterprises and the challenges they created for the publication of important datasets. The extent of the impact by the open data community cannot be therefore analyzed without considering the role of wider socio-political conditions in shaping the dynamics of the open data space.

Chapter 5.
Context Matters: (Geo)political structures of the open data movement

5.1. Introduction

> It seems to me that the real political task in a society such as ours is to criticize the workings of institutions that appear to be both neutral and independent, to criticize and attack them in such a manner that the political violence that has always exercised itself obscurely through them will be unmasked, so that one can fight against them. (Foucault in Chomsky & Foucault, 2006, p.41)

The irony of open data lies in the fact that, while it carries on the mission of challenging proprietary forms of knowledge production and unmasking the political violence through the mechanisms of openness, it in itself acts as a space mediating power relations and inequalities. To properly conceive of open data's potential and impact, one needs to make visible and examine the workings of dominant political structures and interests. This is due to the fact that the acts of resistance, including forms that they take, take place as a reaction to those forces of domination. The previous chapter, by focusing on the micro and meso levels of interactions, revealed the points of tension between the social actors and existing political and technical barriers. It also discussed tactical actions, such as crowdsourcing and digitizing data, which social actors took as a response to the hegemonic challenges.

This chapter places these details within the analysis of the domestic political situation in Ukraine that experts and journalists refer to as the 'hybrid state' (Jarabik & Minakov, 2016), and the current geopolitical realities of the country, specifically the role of Western players in influencing the processes of democracy-building and reforms. The analysis of these conditions elucidate factors that affect group interactions in the open data space and provide an underlying genealogical base for understanding specific cases of power tensions and acts of agency presented in the interview accounts. This chapter will conclude by tying these thematic elements into the discussion of the impact that social actors create by enacting open data-driven technical citizenship.

5.2. Tension of the "Hybrid State"

> ...if Ukrainian society now boasts a new layer of democratic paint, the old oligarchic colors are peeking through in places. (Smagliy, 2017, p.1)

The former Director of the Anti-Crisis Humanitarian Program at the International Renaissance Foundation in Ukraine, Kateryna Smagliy, captures concisely and accurately the situation that has formed in Ukraine after the Revolution of Dignity and the symptoms of which were evident in the interview accounts. The events of 2014 led to the activation of the vibrant civic society and the formation of a new discourse in Ukraine that emphasizes the importance of transparency and accountability, the struggle against corruption, and collective responsibility of reforming the country. At the same time, the corruption schemes, the pressure directed at activists by government officials, and attempts to reverse reforms are threatening to push Ukraine back into the state of pre-revolutionary authoritarianism (Smagliy, 2017). As the previous chapter demonstrated, the open data space demonstrates the same form of political tension. While the civic society was able to take a prominent part in initiating the movement to the extent that would not have been possible before 2014, challenges that they face with bureaucratic system and the active resistance from politicians, highlight prevailing symptoms of the pre-revolutionary regime. Journalists and political experts refer to the situation in Ukraine as a "hybrid state" with "new institutions and vibrant civil society keen to keep leaders accountable" and a deeply entrenched culture of corruption and impunity" prevailing within the state and public institutions (Jarabik & Minakov, 2016). The open data space is evolving in this hybrid state and therefore mediates both its promising and challenging aspects.

Following the end of the revolution, the level of the civil society's involvement in political issues was described as unprecedented by researchers and political observers (Pishchikova and Ogryzko, 2014; Jarabik & Minakov, 2016; Jarabik & De Waal, 2018; Burlyuk & Shapovalova, 2018). New non-profit organizations and activist groups emerged, including the Reanimation Package of Reforms – the largest coalition of non-governmental organizations and experts working towards facilitating and implementing the reforms. A newly established Centre of Support for Reform brought together members of the civil society and representatives of relevant ministries to collaborate on the preparation and

presentation of legislation for reforms (Pishchikova and Ogryzko, 2014). These changes were profound when contextualized in relation to Ukraine's historical path and experience of revolutions. Since the country's independence in 1991, the country has gone through two revolutions – the Orange Revolution of 2004 and the Revolution of Dignity in 2014. Both were expressions of people's frustration about the old corrupt system and their desire for tangible changes. While the period following the Orange Revolution is characterized by the failure of the civic society to retain the political momentum, the Revolution of Dignity brought a decisive break with a typical post-Soviet model of the civil society (Shveda & Park, 2016; Burlyuk & Shapovalova, 2018). The model is characterized by "apathy, low social capital (meaning the quality and density of social networks and interactions beyond one's immediate family and friends), and profound mistrust of all public institutions." (Pishchikova and Ogryzko, 2014, p.6) After 2014, new patterns of social organization emerged with the civil society taking a more active and coordinated role in the state and public matters (Pishchikova and Ogryzko, 2014). In this regards, the Revolution of Dignity had a lasting impact in opening up the channels for a sustainable civic engagement and institutionalizing new social norms and values (Burlyuk & Shapovalova, 2018).

In *Examining social movements and their technologies,* new media and political science scholar Stefania Milan (2013) refers to new opportunities for the civic action as political opportunities or "the structural factors that provide social actors with a chance for action." (p.109)

> Political opportunities might take the form of shifts in governance configurations, and/or shifts in governance culture and discourses. Governance is broadly defined as the realm of activity of mainstream political institutions, including political parties, parliaments, and multilateral agencies. An alteration of governance configurations... might, for instance, translate in the opening of the political arena to new participants, new issues, or both. (Milan, 2013, p.109)

In this context, the 2014 Revolution brought an alteration of governance configurations, namely the election of the new government, the reformation of old institutions, such as the police and the Supreme Court, and the introduction of new laws (Jarabik & de Waal, 2018). With the higher political commitment for transparency and

accountability and under the watchful eyes of Ukraine's Western partners and the European Union, Ukrainian politicians were more willing to hear out the ideas proposed by the civic society and to showcase their political willingness to collaborate. Considering the drastic socio-political changes and newly emerged political opportunities after the revolution, the open government data initiative gained a broader scope and an ideological goal in Ukraine than it would have had if introduced several years or even a year earlier. Ninety percent of the respondents with whom I discussed the implications of Maidan on the open data initiatives confirmed this line of thought. For example, the leader of the Open Data Team from TAPAS, Kateryna Onyiliogwu, commented:

> *When this kind of drastic political events happens, the government wants to be more transparent. Other countries, without undergoing the same changes, continue living their everyday life and implementing open data without making such big leaps. But because Ukraine had this kind of historical situation, the government started pushing for openness.*

The change of the political regime with its transitional legal and regulatory nature provided a momentum for social actors to enact new initiatives of a broader scope and at a greater speed, forgoing the lengthy bureaucratic procedures. The Global Open Data Index ("Ukraine rises by 30 pts", 2017), an international ranking used to measure the countries' advancements in the field of open data, reflects Ukraine's breakthrough: just in a matter of one year from the point of introduction of open data in 2015 till 2016, Ukraine has climbed up 30 positions to occupy the 24th place next to Hong Kong and Poland. The nature of the information disclosure would also be less radical without the revolution, a government employee, noted:

> *The situation would be different without revolution for sure. The change would be more bureaucratic. So the data itself would not be as interesting as it is now. Because there are some very important datasets that are already published and I think if we had a different regime I would say we wouldn't have that information. That's my point view.*

While the new political discourse acted as a leverage for the civil society and other reform-minded social actors to achieve more radical changes, they also faced tensions in their work posed by the "opposite pole" of the hybrid state. Open data initiative pushes for the disclosure of the government owned information, some of which can reveal cases of misconduct and corruption. Among examples is the publication by the Ministry of Justice of the dataset on the declarations of assets of government officials, which revealed miraculous discrepancies between moderate monthly salaries of some state workers and the ownership of expensive cars and properties (Bihus.info, 2017). The disclosure of the government data in most cases goes against the interests of those who want to preserve their reputation and power. Resistance of some government officials to the advancement of open data projects, as demonstrated in the previous chapter, is therefore a manifestation of the hybrid state permeating all the levels of social institutions. Ukraine still faces numerous problems with prevailing corruption, and bureaucracy (Graham et al 2017, Jarabik & Minakov 2016) that hold back the country's democratic development and pose serious challenges for the civil society and reformers to implement social changes.

In 2016, twenty new wave politicians, who previously joined the government to carry out reforms, resigned from their positions claiming that their attempts to create change were challenged and that they have exhausted all the means to carry out reforms (Sukhov, 2016; Haring, 2017; Rogachuk, 2018). The resignation of those politicians from the reformative wave is indicative of the predominant situation characterized by the domination of oligarchic monopolies, burreacuratic political structures, and weak rule of law (Jarabik & De Waal, 2018). The power play between the reformers and some government officials was evident in another case, when in 2017 state officials launched criminal investigations of the Anti-Corruption Action Center, the All-Ukrainian Network of People Living with HIV/AIDS, and the Patients of Ukraine charity (Burlyuk & Shapovalova, 2018). The actions were largely seen as punishment of NGOs for launching the investigations and fighting against corruption (Burlyuk & Shapovalova, 2018). Those in position of authority seem to pursue their personal interests and resist any changes that might threaten their status quo.

The tension of the hybrid state on a broader scale represents a tension between different visions of post-revolutionary development in Ukraine. One vision aligns with public demands for a more democratic and economically stable country and another is

persistently reinforced by those who want to maintain the status quo at the expense of the social change. With this in mind, a question arises, would open data contribute to the realization of people's vision or would the progress be undermined by the limitations of the prevailing political system? While there is no one simple answer to this question and the reality of things would most probably fall somewhere in between the two extremes, the interviews highlighted new forms of collaborative civic engagement around open data that promise to bring the first vision closer to the reality. The open data space provides civil society with certain advantages in knowledge and expertise that are pertinent to the technological domain. By shaping the infrastructures of open databases, tools, and services, social actors working with open data can enlarge the possibilities for democratic participation with the impact extending to other dimensions of Ukraine's socio-political life and enhance the channels for transparent decision-making in areas, such as public procurement, public spending, agriculture, and entrepreneurship. The progress that the open data community has made so far would not be possible without another prominent group of social actors, which has been contributing to reform efforts since Ukraine's independence.

5.3. The Role of the Western community

> Over the past four years, the main drivers of the reform have been Ukraine's Western partners and its active nongovernmental sector, putting pressure on the government in what has been called a "sandwich" maneuver. (Jarabik & De Waal, 2018)

In the light of the existing resistance from the government, Western actors have become important collaborators of the Ukrainian civil society in their work to enact reforms and create broader social changes. While Ukraine's recent geopolitical shift toward a closer association with the West and the European Union deepened the partnership in recent years, the Western community have been already collaborating with Ukrainian civil society groups since the country gained its independence from the Soviet Union. The interview findings highlighted the presence of this collaboration in the open data space. Most of the non-profit civil organizations currently working with open data and represented by interview respondents are financially and technically supported by Western international organizations/state-funded aid programs. Interview accounts also highlighted

the role of the international community in acting as an external leverage in ensuring the publication of open data by government entities and creating a supportive environment for implementation of open data initiatives. These findings reveal another important aspect of the open data initiative – its embeddedness in the wider geopolitical structures and historical discourses of the Western involvement in Ukraine's political development. In the context of the interview findings, I would like to add another dimension to the definition of the open data space. Specifically, the open data space mediates the current geopolitical dynamics between Ukraine and its international political actors and represents the aspiration of the Western community for democracy building (Carothers 2002). These broader political structures, in turn, delineate the possibilities for the local social actors to act with the external support within the open data space.

The Western support for democracy-building initiatives in Ukraine is reflective of the trend that has formed in the end of 20th century with the fall of authoritarian and communist regimes and eventually the demise of the Soviet Union in 1991. These political changes were enthusiastically interpreted by the West as the global wave of democratization or what some political scientists referred to as the "third wave" of democracy (Carothers, 2002, p.2). Around that time, a diverse range of governmental, semi-governmental, and nongovernmental organizations devoted to promoting democracy abroad sprang into being (Carothers, 2002, p.3). The new democracy-promotion community embraced the analytical model of democratic transition in order to talk about, think about, and design interventions in the processes of political change in the newly "liberated" countries (ibid). The main assumptions of the democratic transition model were that any country moving away from the authoritarian system could be considered to be in transition to democracy and that the process of democratization could be described by the set of predetermined stages. While scholars pointed out the model's limitations in assuming the linear democratic development (Carothers, 2002; Diamond et al., 2014), it is still widely used by Western political institutions and public organizations to organize their humanitarian, technical, and financial assistance in post-authoritarian and post-Soviet countries, including Ukraine.

With prevailing inefficiencies in Ukraine's government institutions, Western social actors perceive the civil society as an important actor in influencing the state and carrying out democratic initiatives that the government is unwilling or unable to address (Lutsevych,

2013). On this basis, a tradition of collaboration has formed between the Ukrainian civil society and international organizations. The aim was to address and provide solutions to the existing social problems, including corruption and lack of governance transparency. In relation to the open data movement, the interviews and secondary sources have highlighted that Western organizations provide the administrative and financial help to all of the non-profit organizations represented by interview respondents. Interview respondents explained that the current funding model for open data projects exists because of the lack of financial support from the Ukrainian government. One of the open data advocates working with the government commented, "[Government officials] don't understand why Open Data and any other ICT solutions need funding." Another respondent noted, "most of the funding comes from grants and donors - that is how it usually works here, especially with transparency and anticorruption issues." The distinct conditions of Ukraine's politics, including the government's active resistance to reforms, has therefore contributed to the formation of alliance between the Western actors and the Ukrainian civil society to address the existing problems.

As interview respondents noted, the biggest organization currently collaborating with the Ukrainian government and working on implementing open data on the national level is TAPAS, a $19 million five-year project funded by the UK government affiliated UK Aid and the U.S Agency for International Development (USAID). USAID in particular has been a prominent sponsor of Ukrainian civil society initiatives, contributing approximately $1.9 billion in economic and social projects since 1992 (Lutsevych, 2015). Open Data Incubator 1991, the first civic tech incubator in the country working with startups, is also sponsored and supported by USAID, as well as another organization Western NIS Enterprise Fund (WNISEF). An activism and data analytics organization Texty.org.ua that carries out numerous investigations and workshops based on open data, is funded by The Eurasia Foundation, International Renaissance Foundation, representatives of European Commision, and National Endowment for Democracy, a regional private equity fund of WNISEF, initially funded by the U.S government. Overall, the organizations funding and administratively supporting Ukrainian open initiatives are mostly affiliated with the European Union and the US. No organizations were found to be in partnership with Russia or CIS countries. One of the interview respondents also mentioned that while the Ukrainian open data community previously exchanged experience with Russian open data organizations, this connection was gradually lost after 2014.

The current events unfolding in the open data space are therefore reflective of the political relations that have formed between Ukraine and other international actors after the 2014 Revolution. Open data initiatives provide solutions for anti-corruption issues, public procurement, public finances, among other areas, which Western partners see as the priority for Ukraine's democratic development, its aimed economic integration and political association with the European Union, and the international security of the region. In fact, the major funding from the Western partners International Monetary Fund (IMF) ($17.5 billion) and EU (3.4 billion euros) to support the country's macroeconomic stability and military activities in the east (Jarabik & De Waal, 2018), is to a large extent conditioned on the Ukrainian government's progress in implementing the reforms. This conditionality was clearly evident when both the IMF and EU delayed their funding due to the Ukrainian government's failure in fulfilling commitments in the anti-corruption area (Olearchyk, 2018; Jarabik & De Waal, 2018). Funding has become a leverage for the Western international community to keep Ukrainian politicians accountable for their promises, as they require the support of the West for their domestic political activities (Jarabik & De Waal, 2018).

In this context open data has also become a mutually shared space for the West to monitor the reform progress in Ukraine and for Ukrainian politicians to demonstrate their ability to fulfill their political promises. The accountability that politicians hold encourage them to support civil-led open data initiatives, even though in some cases their direct participation remains to be minimal. One of the interviewees working in the area of open data advocacy noted that with the government's failure in other areas of reform, publishing data is often "one of the easiest ways for the government to demonstrate to its Western partners that they are doing something." Another interviewee working in the non-profit organization mentioned, when it comes to supporting civil-led open data projects, "we need to persuade the government officials that they would not need to do anything – there is a project and just say a word. That is how it usually works sadly". The advantage for the civil society in this ironic, but not entirely unexpected, situation is that the accountability that politicians face from the Western community (PAIC, 2018) provides a political leverage for the civil society and startup communities to gain support from the government and develop highly impactful open data projects and tools, such as in the case of electronic public procurement program Prozorro, which has solidified procurement reform in Ukraine

(Prozorro, 2018) and has saved taxpayers $1.9 billion since its introduction in 2016 (UNIAN, 2018).

Ukraine's path in democratic development and reform is far from being simplistic and linear. Most of the changes that would be enacted by state institutions in other countries are carried out by civil society and other social actors with the assistance and consultation of Ukraine's Western partners. It is not within the scope of this research to analyze the implications of external influence and geopolitical interests on Ukraine's path of development. Nevertheless, the impact that civil society and other social actors are creating with open data initiatives cannot be understood without considering the role of international nonprofit and state-affiliated organizations, as well as the broader geopolitical developments. While being highly localized in specific cases, open data initiatives also evolve within the international socio-political structures that shape the conditions and possibilities for enacting technical citizenship in the open data space. The international community plays an important role in leveraging government's support to advance open data projects, acting as a sponsor and collaborator in consulting and providing the technical support, and funding civil initiatives. The support from the West enlarges possibilities for Ukrainian social actors to push open data initiatives forward and encourage government officials to support certain efforts. Since most of the current open data projects and organizations are funded externally, one of the questions that needs to be addressed is the long-term sustainability of open data initiatives and the ability of local actors to realize their goals without external assistance. In the long run, the open data movement requires more substantial administrative and financial support from the Ukrainian government than exists at the present moment.

5.4. Technical Citizenship and the Politics of Technical Design

Parliament's Open Data Portal (PODP) is an open data initiative that demonstrates an example of technical citizenship by the civil society members and the consequent tensions that they faced in reconfiguring the information infrastructure of the Ukrainian Parliament. PODP started as a part of the Open Parliament Project (OPP) with a goal to enhance 1) access to information, 2) involvement of citizens in the parliamentary

processes, 3) accountability, and 4) technology and innovation. The project was a collaboration between the Ukrainian Parliament, the United Nations Development Programme, and the network of Ukrainian NGOs, including Opora, Chesno, Transparency International Ukraine, and Eidos (Transparency International Ukraine, 2018). On 5th of February, Ukraine endorsed the Declaration on Parliamentary Openness, a global initiative established between national parliaments to encourage citizens' involvement in political and governance processes. The Prime Minister of the Ukrainian Parliament signed an order approving the Open Parliament Action Plan (Transparency International Ukraine, 2018), which NGOs took an active part in by developing and outlining commitments of both the Ukrainian Parliament and the civic society. The nonprofit civil network OPORA, which has been monitoring electoral processes for years, led the implementation of Parliament's Open Data Portal project in partnership with the State Agency of Electronic Governance. The goal was to develop a portal, where the public data on MPs, bills, plenary sessions, legal framework, financial and economic information, and organization structure of the Verkhovna Rada Administration would be displayed in the machine-readable and interoperable format (Open Parliament Ukraine, 2016) and accessible for wider public to view, share, and re-use.

Two interview participants, who were involved in coordinating and developing the project at the time, provided more details on the initiative. The main objectives of the portal were to bring a greater transparency to the parliamentary processes, engage citizens and experts in the field in keeping track of government decisions, and encourage the creation of new analytical products and instruments based on open data. To enable an inclusive use of the data and further data-based developments, the initial intention of the team was to build the portal based on the open Application Programming Interface and open code. The process of designing and implementing the portal in turn involved different technical considerations, including negotiations with government officials on the type of datasets that should be published, information to be included in the datasets, details on the interface design, and structuring and formatting the data according to the principles of open data using machine-readable formats: csv, json, and xml (Rada News, 2016).

Despite the portal's promising benefits and the plan to eventually integrate the portal with the national open data portal, the project was in the end closed by the parliament. The former coordinator of the PODP commented on the situation:

> *[After we designed the portal], [open data users] used to work with it to create their own analytical tools. But after one year, the parliament decided to close this project and to create their own one using their own operating system. [It came] with the lack of user interface and with the lack of understanding that the [portal] should be based on the feedback system [from users]… so it means that in the end, they did what they wanted to do, not what the public wanted or what the public's demand was.*

Based on this interview account, the disagreement that led to the end of the project manifested itself in the disagreement between the civil society and government officials over the technological design of the open data infrastructure. Interview participants did not specify the details on the disagreement and the technical differences between the demo version and the currently running portal. Nevertheless, on a broader level the disagreement between civil society and government officials was about two different visions regarding the technological development: one supported the openness, transparency, and inclusivity and another vision advanced proprietary ownership and restricted access to decision-making. Another respondent, who at the time was the project manager of PODP, describes the general tension that exists outside of the project in relation to the use of programming language and data formatting:

> *Currently many activists are criticizing the situation…The data are not actually open data if they are in private proprietary formats, [like] in excel and doc. Also, if the websites and portals are created by the government, they most probably will be written in proprietary languages. The projects by the civil society will by written in Python or other open-source languages.*

The format of data, the choice of the programming language, the operating system, and the availability of a feedback system for users to contribute their suggestions, have wider implications for the democratic participation. Specifically, in regards to PODP, these technical nuances determine if public actors can participate in making decisions regarding

political processes in the parliament. The format/structure of datasets and the code used to design a website determines whether a wider public can easily access and interpret data using different software programs, suggest technological improvements to the website by reading its code, and use data to design new data infrastructures in the form of tools and services. These considerations all concern the right to exercise technical citizenship (Feenberg, 2017). In pursuing the PODP project, civil society members aimed to design a more open and inclusive infrastructure for the public to interact and communicate with the parliament and with the help of accountability mechanism to ensure the transparency of its processes. By enacting political agency "at the intersection of ideology and technique" (Feenberg 2002, p.15), the goal of civil society was therefore to construct a new technical code (Feenberg, 2017) for the informational infrastructure of the Ukrainian Parliament according to the vision of of inclusivity and openness.

One can find other examples of open data initiatives where the civil society succeeded in reconfiguring technical codes and creating highly impactful changes, such as E-Data (spending.gov.ua, n.d) and an award-winning Prozorro software (Prozorro, 2016). However, the case with PODP is particularly demonstrative of the kind of tension that exists in the open data space and reveals power implications posed by the hybrid state in Ukraine. The problems that political experts and journalists observed with the hybrid state on a broader societal scale, such as bureaucracy and opaque political activities, play out on the most basic technical level in an act of publishing a specific dataset or designing an open data and open source website. Most of the social actors working on open data initiatives experience and struggle against this "push" from the hybrid state in one form or another, regardless of whether the projects succeed or not.

In the light of existing barriers, social actors employ different actions, from oppositional to collaborative stances and tactical actions, to overcome existing challenges and enact the technical citizenship. Michel de Certeau (1980) defines tactical actions as maneuvers, improvisations, and opportunistic acts from within the dominant system by the subjects of power, who lack the legitimate base to enact change. Even though the government introduced amendments to the Law On Access to Public Information, which requested government entities to publish open data, the interviews highlighted that the presence of the law does not prevent some institutions and government officials to ignore the law's specific requirements or entirely neglect it. Aside from those political challenges,

basic technical and administrative issues, such as lack of government workers' knowledge and skills related to open data, the absence of technical infrastructure to support publication and management of data in the government entities, and the lack of workforce, create additional barriers. In this light, the startup community and civil society refer to tactical actions to address the absence of specific datasets by generating and collecting their own data and, in some cases, digitizing government documents and structuring data into open data, such as with the impressive volunteer-led project Declarations (Bihus.info 2017).

Open data has given rise to a new form of political agency, which takes place at the intersection of political and technological domains. While social actors also deal with the same kind of socio-political problems as the reformers in other fields, the technical nature of the open data space enables them to address challenges in a novel way by relying on the technical knowledge and skills. The case with PODP exemplified a more acute form of tension that social actors face with the institutional barriers. But other examples, such as the project Declarations led by the nonprofit organization Bihus (Bihus.info 2017), demonstrated an impressive ability of civil society to overcome the barriers and mobilize to reconfigure the technical infrastructures and lead the struggle against corruption.

5.5. Conclusion

Impactful changes that civil society alongside with other social actors achieved in the open data space are far from being as simplistic and linear as the mainstream media often tends to portray. The interview findings most probably have not revealed a full picture of factors that were unfolding "behind the scene", but nevertheless they provide insights for a more nuanced assessment of the impact of the open data movement. Being careful not to fall into technological determinism, I argue that the introduction of open data in Ukraine did produce its own kind of internal revolution by initiating new discourses, practices, culture, and political opportunities (Milan 2013). These changes extend beyond the technological dimension into other areas of socio-political endeavour and address wide-ranging issues, such as corporate raiding, ineffective use of agricultural resources, and opaque government processes. A good indicator that the open data movement is carving out a solid foundation for further impactful changes is the fact that its evolution

takes place on both the grassroot and institutional levels. For instance, on the institutional level, new laws, such as Law of Ukraine on Public Procurement (Vox Ukraine, 2017) and the Law of Ukraine "On the openness of the use of public funds" (Eidos, 2015) enabled the institutionalization of the open data publication in public spending and public procurement fields. At the same time, open data based tools that civil society developed in the corresponding fields helped to solidify the reforms on a grassroot level. It is also worth noting that the Law of Ukraine "On the openness of the use of public funds" was made possible largely due to the advocacy work of the civil organization Eidos (Eidos, 2015).

Efforts that have been made so far in the open data space cannot be sustainable in the long run without broader institutional changes in the future. These changes include the reform of Ukraine's governance system, particularly of judiciary and executive branches that facilitate the enforcement and proper functioning of the laws. One of the interview respondents mentioned that even though the open data tool, which his team developed, helped to uncover "over 50 court cases on corruption and misconduct...on the open data portal...the reform of the court system is required so that actions can be taken regarding these revelations." Civil society actors and reformers from the government have made significant achievements in institutionalizing and developing open data in Ukraine. However, there are still serious political and social institutional challenges that remain to be addressed.

The impact of the open data movement is therefore a process that evolves in line with Ukraine's political and social developments and the country's broader geopolitical relations. Both challenges and successes of the national reforms, government policies, and laws contribute to the overall impact of local open data initiatives. In this chapter, I presented the analysis of the open data movement in relation to Ukraine's current politics and the geopolitical situation. By examining some of the broader structures shaping the open data space, specifically the relationship of tension exemplified by the "hybrid state" and the role of the Western community in delineating new possibilities for social actors' actions, my aim was to bring to view additional dimensions that are shaping the way the open data community is creating impact and enacting technical citizenship.

Chapter 6.
Conclusion

6.1. Introduction:

Neelie Kroes, the former European Commissioner for the Digital Agenda, noted during a press conference on Open Data Strategy in 2011: “Just as oil was likened to black gold, data takes on a new importance and value in the digital age” (Neelie Kroes; 2011). Half a decade later, the fascination of entrepreneurs, software engineers, and politicians, among many others, with the commercial and social potential of big data and open data has not exhausted itself. The open data movement, which started in a post-Soviet and post-revolutionary country in Eastern Europe in 2015, encouraged experts and observers to frame the impact of open data as a solution to that country’s existing political issues. The leader of one of the NGOs working with open data in Ukraine described the new initiative as a “revolution-driven”, referring to the influence of the 2014 Revolution in setting the goals of the movement. He defined two main vectors according to which the NGO carries out its projects. The first one is “reducing the impact of the war” and the second one is “developing and creating a new country from the ruins”. The online magazine *Business Ukraine* published an article about the open data movement (Liakh, 2017): “Ukraine’s open data revolution: How Europe's most corrupt country became the continent's most transparent nation”. The article discussed the role of open data in helping Ukrainian society to move beyond the post-Soviet era and embrace integration with the EU.

Hopes that an innovative use of technology can bring positive changes to the country are substantiated with examples of impactful open data initiatives that have been introduced since the end of the revolution. Among the examples are successful electronic public tools in the areas of public spending and public procurement. Nevertheless, the process through which open data creates an impact is far from being linear and simple, as the examples above portray. Rather than being implemented in a cause and effect manner, open data initiatives, as interviews demonstrated, often involve complex interactions of social actors with institutional structures and authorities, who actively resist new changes. In response to the existing challenges, social actors employ different types of actions, ranging from collaborative to tactical and oppositional, to overcome certain

systematic challenges and realize their initial goals. At the same time, the cases provided in this thesis demonstrated that the post-Soviet legacy manifested in the institutional arrangements, such as state-owned enterprises, pose serious barriers that are difficult to overcome without broader reforms introduced from the government's side.

What media refers to as the ability of open data to propel the Ukrainian society past the post-Soviet era is inaccurate, at best. The inaccuracy lies not as much in highlighting the non-existent potential of open data as in framing it as an instrument that can be directly applied to heal political and social ills of Ukraine. While the institutionalization of open data has opened up the channels for new forms of democratic actions, the open data movement inevitably unfolds in alignment with other reforms and political developments in the country. Its interactions with other fields of endeavour is therefore bi-directional and mutually constitutive. In this sense, open data acts as a process, rather than a tool. As Dalton et. al (2016) noted, the nature of data is spatial. Data originates from a specific context with its own power dynamics, rationalities, and institutional arrangements and therefore acts as an inseparable element of a system or assemblage, rather than as an external linear force.

This thesis referred to the critical scholarship in communication and technology and the methodological formulations of STS to conceptualize the acts of technical politics and social actors' interactions with existing social and political structures. In the first part of the analysis I relied on the concepts of relevant groups and interpretative flexibility in STS to complement my critical study approach. Through interviews, I examined how different social actors in the open data community shape the meaning and consequently the use of open data through interpretative processes, which are informed by their professional field and goals, and their participation in open data processes. In the second part of the analysis I contextualized the discussion in relation to the broader themes of political and geopolitical realities of Ukraine. This chapter summarizes the main findings through three main narratives: the open data movement as a space of convergence, (geo)politics of open data, and the evolvement of open data between the tension of 'universal' and 'local'.

6.2. The Open Data Movement as a Space of Convergence.

The institutionalization of open data brought together social actors from different fields and contributed to the formation of a heterogenous and intersectoral space of convergence (Chow-White & Garcia-Sancho, 2011). While social actors from civil society and the startup community share a common goal of implementing reforms and creating broader social changes in Ukraine, they also articulate localized meanings of open data in relation to their field of endeavor. Along with the social actors from government institutions, these two groups engage in the processes of data publication and governance, data usage, and data intermediation.

The Ukrainian government, which includes national and municipal entities, is responsible for defining governance frameworks for open data and publishing it on the national open data portal and their own websites. Interviews demonstrated that since the work with open data requires specific knowledge and skills, members of civil society by relying on their cultural and social capitals were able to collaborate with government officials and the international community in defining the laws for publication and regulation of open data. This included the assistance with drafting the Law on Access to Public Information and the creation of a demo version of the national Open Data Portal. The Ukrainian civil society, consisting of investigative journalists, open data advocates, and nonprofit organizations, is the most prominent group of social actors using open data to create new tools and services. Their focus lies in fighting corruption, reforming the public administration, and enabling new channels for the democratic participation of the citizens. Civil society covered a significant number of intermediary activities that the government usually does in other countries, such as organizing educational sessions and workshops, taking part in digitizing and structuring government datasets, and facilitating regional and municipal networks of collaboration in the open data community. The startup community is a relatively nascent group of open data users that entered the open data space with market-oriented and entrepreneurial rationalities. While open data startups function based on the business model and see the movement as an opportunity to participate in a newly emerging market, they also engage in what Hess (2007b) refers to as “alternative pathway” or a form of social action that exemplifies “complex mixes of social change goals with goals of profitability.” (Hess 2007b, p.4) In Ukraine’s highly centralized and controlled

economy, civic entrepreneurship activities of startups also contribute to a more diverse, innovative, and competitive economic environment.

When asked about the main achievements of the movement, almost all the respondents mentioned the creation of the legal and governance frameworks as a significant achievement. Sixty percent of respondents directly mentioned the presence of impactful open data services and tools, such as Prozorro, E-Data, and Open Bot as another achievement. Ninety percent of participants either directly or implicitly identified corruption and bureaucracy of the prevailing political regime as a serious challenge to the development of the movement. Technical considerations, such as the availability and quality of datasets stood out as another salient issue. The respondents referred to the absence of technical infrastructures for storing and publishing open data in government institutions as one of the reasons for the problem. Most of the data that the government collects are still stored either on paper or in 'close' formats, such as pdf, xls, and doc. Respondents also mentioned the lack of understanding of open data and low levels of data literacy as another factor impacting the availability and quality of datasets. To address this particular issue, civil society took an active part in organizing trainings and providing consultations to the open data community.

6.3. (Geo)politics of Open Data.

According to the critical data and technology studies scholars, data is never neutral. It is embedded in the broader network of institutions, regimes, and political systems. In the Ukrainian context, the Revolution of Dignity played a significant role in shaping the dynamics of the open data movement. Ninety percent of interviewees saw the revolution as an enabling factor for the institutionalization of open data and consequently the development of the open data movement. The respondents noted that the change in the political regime and Ukraine's geopolitical shift towards the West contributed to the political will for supporting civil society's efforts and determined the scope of open data's institutionalization, kind of datasets that were disclosed, and the extent to which civil actors were able to be involved in shaping the movement.

Social actors however also faced tensions in their work that relate to the socio-political conditions prevailing the Ukraine. These conditions were observed (Smagliy,

2017) and described by political commentators as Ukraine's "hybrid state" (Jarabik & Minakov, 2016), characterized both by an unprecedented mobilization of the civil society and the domination of vested interests in economic and political spheres. In this context, social actors refer to what Stefania Milan calls a repertoire of actions in social movements (Milan, 2013), ranging from oppositional to collaborative and tactical (de Certeau, 1980), to overcome barriers and realize their goals.

The international community, specifically the Western international organizations/state-funded aid programs, play an active role in supporting the open data movement. Most of the existing open data initiatives and organizations, including the ones represented by interview participants, are funded and administratively supported by international organizations. The literature on Western policies regarding post-authoritarian and post-Soviet countries (Carothers, 2002; Lutsevych, 2015) pointed out the historical tradition of the Western democracy-building communities in assisting countries to transition to democracy and supporting initiatives of their civil societies. Open data initiatives in Ukraine addresses the key areas, such as in anti-corruption and public administrations reforms, which Western partners see as a stepping stone towards the country's democratic development and integration with the European Union. The financial and administrative support that the international community provides to most of the Ukrainian organizations working with open data can be therefore understood in relation to Ukraine's current political relations with the West. The open data movement has become a space that mediates the country's geopolitical dynamics. Western organizations, who also provide a considerable level of financial support to Ukrainian politicians, act as an external leverage in keeping the government accountable to their reform commitments and helping the civil society to implement new initiatives.

6.4. The impact of Open Data: Tension between the "Universal" and the "Local".

The two main legislative documents - the law on the public access to publicly funded information (EU Public Procurement, 2015) and the Decree 835 issued by Ukraine's Cabinet of Ministers define the technical and legal frameworks for the official status of open data in Ukraine. The Open Data Roadmap, an action plan designed to guide the Government of Ukraine in publishing open data, is based on the six principles

of International Open Data Charter that in turn define good practices of open data publication (Eurasia Foundation, 2017). While the standards for implementing open data are concrete and straightforward, the actual evolution of open data within Ukraine's context happens in interaction with various social and political factors. There is therefore a tension between a "universal" rigid concept of open data and the "local" and more contingent developments. This dual quality of open data as a technical artifact was captured accurately by Susan Leigh Star (2010), as she observed the paradoxical nature of today's technological development. Star and Ruhleder (2015) note that with the rise of decentralized technologies across wide geographical distance, "both the need for common standards and the need for situated, tailorable, and flexible technologies grow stronger" (p.378). Therefore, "there are no genuine universals in the design of large-scale information technology" (ibid). In the context of Ukraine, open data acts as both a "universal" artifact that is defined by international principles, and a "local" contingent technology that manifests itself in relation to existing social actors, technical infrastructures, and systems of knowledge and power production.

One of the examples of this contingency is the fact that while in Summer of 2017 more than 1500 datasets were published on Ukraine's national open data portal, only 5-10% of them were actually open data as defined by international technical requirements. While the open data movement aims to bring local initiatives closer to universal ideals, the actual developments are contextual. They evolve in between the tension of the "universal" and the "local". Social actors follow universal principles of open data and work with technical format and structures identified by the international standards. At the same time, they reserve to creative tactical rearrangements to shape open data in accordance to the limits and possibilities of the Ukrainian context. When there are no datasets on road conditions, they crowdsource data by using the accelerometer and gyroscope. When the government publishes "open data" in non-machine-readable formats, social actors form volunteer networks to clean and reformat the data. When they face the resistance from political authorities, they find points of mutual interests to push open data initiatives forward, as the case with the partnership with Western organizations has demonstrated. The impact that open data creates, cannot be properly understood in a linear and cause-effect manner. Rather it is a process that unfolds in between the tension of universal principles and local realities. While the Ukrainian open data community follows specific

international requirements in facilitating the open data movement, it also takes actions that are informed by social and political conditions in the country.

One of the ways to develop this research further would be to narrow down the focus to a particular open data initiative/project to gain a better understanding of the way open data impacts particular sectors and fields. The initial goals of my research were informed by a specific time period in the development of the Ukrainian open data movement. At the time when I chose the topic in 2016, only one year has passed since the initiation of the movement. In my research I therefore maintained a broader scope in order to better understand the "bigger picture" of a newly emerging movement, specifically what organizations and individuals were taking part in it, the fields they represented and various goals that open data promised to fulfill. Interview participants were highly considerate and cooperative in sharing their insights and experiences. Their responses about existing open data initiatives, such as E-Data, provided valuable insights about interdisciplinary collaborations that this thesis could not address in more details due to the study's scope and time limitations. These insights could be further elaborated and developed into separate case studies examining the politics of open data in a particular field or sector by following up with interview participants and collecting additional data about specific open data projects. In addition, the impact of open data in this research was mostly evaluated based on the extent to which open data initiatives were successfully developed and launched. I did not have chance to evaluate the impact based on the actual use of open data tools and services by the general public, which would be a productive way to contribute additional insights to the study of the open data reform.

As a nascent movement, the Ukrainian open data movement is still in its early stage of formation. Even though activists are currently facilitating the development of open data in other Ukrainian cities, the open data community is mainly concentrated in the capital Kyiv with a relatively small number of social actors possessing knowledge and skills to work with open data. As meanings and uses of open data are still being defined under the processes of interpretative flexibility, decisions and actions that the open data community takes at this defining moment have important implications on the way the movement will develop in the future. My hope is that this thesis was able to provide complementary insights on the current initiatives from the perspective of an external observer and raise awareness about the implications of the socio-political context of open data initiatives in Ukraine and elsewhere for those who are interested in researching the

topic and those who are working on the practical aspects of open data development and implementation.

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