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Open data in Ministries of Defense

An analysis of institutional factors influencing proactive data transparency in the Netherlands, United Kingdom and United States

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Executive summary

Open government data initiatives are said to create democratic and economic value all around the world. However, recent findings suggest that the success of open data varies across policy domains (Ruijer, Détienne, Baker, Groff & Meijer, 2019). Therefore, this study investigates open data in a policy domain that has remained under the radar of the scientific community: open data from Ministries of Defense (MoDs). In doing so, this research builds on the literature that considers the effect of institutional factors on open data utilization (Safarov, 2019). Three countries are considered: the UK, the US, and the Netherlands. Thus, leading to the following research question:

> *"How do institutional factors influence the proactive transparency of government data in the Ministries of Defense (MoDs) in the Netherlands, the UK, and the US?"*

To answer this research question, this study offers a unique data-assessment tool to grade the strength of open data in MoDs. The data-assessment makes a distinction between open data that is provided in MoD-specific and ministry-wide policy categories. Data in MoD-specific policy categories directly relates to information about the military, its activities, and their equipment. Data in ministry-wide policy categories can also be published by other ministries, for example, budget data. This research finds that the provision of open data is stronger in ministry-wide policy domains.

In addition, this study applies a method of causal-process tracing (CPT) to understand the influence of three institutional factors: policies and strategy, legislation, and organizational arrangements. The results show that the effect of each institutional factor is different in MoD-specific and ministry-wide policy categories. In ministry-wide policy categories, it is shown that legislation strongly influences open data in MoDs. In MoD-specific policy domains, it is shown that organizational arrangements, such as having a demanding supervising authority, lead to more open data. This is also true for policy guidelines, which are of great importance in establishing open data in both policy categories.

The results of this study have theoretical and practical implications. Theoretically, this comparative study affirms that institutional factors can have different influences on different policy domains (Ruijer et al., 2019). Datasets in MoD-specific policy categories raise security and privacy concerns, and it requires strong organizational arrangements to handle data with potentially higher levels of sensitivity. Legislative foundations are less influential because divergent laws enable MoDs to keep data as secret. Additional findings, not covered by the theoretical model in this research, show that future research is needed to investigate the role of social and political pressure, leadership, and the role of civil society. Practically, this research provides inspiration for policy-makers within MoDs who have an interest in sharing open data. The research shows, for example, that the UK shares more open data about military personnel and medical information. In the Netherlands, the provision of such data is weaker because it is not shared in open-format. This shows that MoDs can learn from each other's open data provision. However, to systematically improve open data provision, MoDs will benefit most from being pushed by a demanding (higher) authority that instructs MoDs to create sector-specific policy guidelines.

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1. Introduction

1.1. Open data: a driver for proactive transparency

Open data initiatives from governments are receiving attention all over the world. Many governments acknowledge the importance of transparency, as it can be seen as a measure of good governance performance (Van Dooren, De Caluwe & Lonti, 2012). This is also illustrated by the fact that 79 countries are currently participating in the Open Government Partnership (OGP, 2020). All participating countries commit to creating two-year action plans with concrete steps about enhancing transparency, accountability, and civic participation. Providing open government data is one of the commitments that can achieve the aforementioned goals, which is why many academics have examined the potential benefits and barriers of successful open data implementation (cf. Attard, Orlandi, Scerri & Auer, 2015; Barry & Bannister, 2014; Zuiderwijk & Janssen, 2015).

The provision of more open data by governments also illustrates a significant shift from reactive towards proactive releases of information (Lee & Kwak, 2012). Compared with freedom of information (FOI) mechanisms, open data requires governmental agencies to actively think about the information that can be of interest to the public. It stimulates governments to become engaged in a more open system that stimulates collaborative networking with external stakeholders (Chun, Shulman, Sandoval, & Hovy, 2010). This shift can also lead to chaotic and unpredictable results, depending on how open data initiatives are implemented (Worthy, 2015). This is why it is important to consider how open data is utilized in different policy domains.

1.2. Utilizing open data: differences in policy context

The extent to which open data initiatives achieve their democratic and economic goals depends on the context in which it is applied (Safarov, Meijer & Grimmelikhuijsen, 2017). Recent findings suggest that transparency of open data is less easily provided in “harmful” policy domains (Ruijer, Détienne, Baker, Groff & Meijer, 2019). Issues that are high on the political agenda, and are accompanied by many uncertainties, can hinder policy-makers from providing more open data. The fear that external stakeholders will purposively try to misinterpret or manipulate the data against the public interest is reinforced when dealing with contested issues (Barry & Bannister, 2014). It is, therefore, important to study the differences in open data implementation in different policy domains (Ruijer et al., 2019).

This study aims to contribute to this debate by researching a policy domain that has remained relatively under the radar of the scientific community: open data that is provided by Ministries of Defense (MoDs). To the knowledge of this study, there is currently no research that details how open data in MoDs is created and the extent to which their implementation is successful. A rare exception is provided by Whitmore (2014), who explored the opportunity to predict wars based on the spending activity of the US Department of Defense (DOD). This paper aims to contribute to this lacuna in the open government data literature by exploring how open data has crystalized in the Ministries of Defense in the UK, the US and the Netherlands.

1.3. Research goal and question

It is this research goal to assess and explain the open data that is provided by MoDs in the UK, US, and the Netherlands. There are currently few comparative studies that systematically consider the differences in open data adoption across countries, let alone for a specific ministry such as the MoD. The three countries are considered because they generally rank high in transparency benchmarks (cf. GODI, 2017a; Open Data Barometer, 2017). MoDs are typically transparency-averse ministries, which makes the selection for high performing transparency countries a critical decision. This choice increases the likelihood of finding relevant information about how open data is established in the context of MoDs.

To further understand open data from MoDs, this paper aims to have a look at the institutional factors influencing the proactive disclosure of open data. Potentially there is a wide variety of factors influencing the extent of transparency provided by the government. Technological, social, and institutional conditions can play an important role in shaping the way transparency is performed (Jetzek, 2016; Safarov, 2019; Yang & Wu, 2016). This paper aims to build on the literature that considers the institutional dimensions affecting transparency in different countries (Ruijer & Meijer, 2016; Safarov, 2019). This strand of literature provides insights into how transparency and open data finds local meaning in different institutional contexts. The UK, the US and, the Netherlands are expected to build upon different pre-existing institutional arrangements, which is why a comparison of these countries can provide insightful information about how open data in MoDs can be established. To further assess and explain the open data that is provided by MoDs, this study articulates the following research question:

> *"How do institutional factors influence the proactive transparency of government data[1] in the Ministries of Defense (MODs) in the UK, the US, and the Netherlands?"*

This research question requires an empirical investigation into both independent variables (institutional factors) and the dependent variable (open data in MoDs). The institutional factors will be analyzed on the basis of three institutional factors: policies and strategy, legislation, and organizational arrangements. These institutional factors are inspired by Safarov's (2019) theoretical framework, which enables for a strength assessment of each institutional factor. This study will assess the strength of each institutional factor based upon interviews and a document-analysis of scientific literature, policy documents, legislation, and relevant journalistic articles. To assess the strength of open data in MoDs, this study develops a unique data-assessment tool that can be applied to grade the provision of open data in MoDs. Current open data-assessments are specifically designed to assess the strength of open data by national governments (GODI, 2017a; Open Data Barometer, 2017), which is why a new specific open data-assessment tool for MoDs was required. In addition, this study applies a method of causal-process tracing to analyze the information that is generated from the interviews and document-

[1] In the remainder of this thesis, 'proactive transparency of government data in MoDs' is referred to as 'open data in MoDs'. For a more complete discussion about definitions of open data in the scientific literature, see chapter 2.3.

analysis. With this method, conclusions can be made about the relationship between the institutional factors and the provision of open data in MoDs (Blatter & Haverland, 2012).

1.4. Scientific relevance

This paper aims to make two contributions to the literature about the governance of open data. First, this paper will explain how open data is provided in a policy domain that has been given insufficient attention. Establishing transparency is more complex in sectors, like the MoD, where openness can have drawbacks for safety (Colaresi, 2014; Roberts, 2006). Recent findings suggest that politically contested 'harmful' policy domains are less likely to share open data (Ruijer et al., 2019), especially due to a fear for external stakeholders who can use the data against the public interest (Barry & Bannister, 2014). Therefore, more knowledge is needed about the differences in open government data between different policy domains (Ruijer et al., 2019). This lacuna in the open data literature will be addressed by investigating how open data is provided in MoDs; a type of government organization that is understood as having an internal bias towards secrecy (Brown, 2015).

Secondly, this paper aims to contribute to the literature that can explain the strength of open government data implementation. Technological and social factors can influence the success of open government data implementation, and especially the social component is complex and requires further investigation (Yang & Wu, 2016). This research explains the social component of open data in MoDs by drawing upon the literature that considers institutional dimensions affecting transparency in different countries (Ruijer & Meijer, 2016; Safarov, 2019). This literature acknowledges the explanatory power of pre-existing institutional arrangements that can explain the provision of transparency and open government data. By taking a comparative case-study approach, this paper is able to distinguish the influence of three institutional factors (policy and strategy, legislation, and organizational arrangements) in three different countries. The comparative nature of this research can yield stronger theoretical insights into how open data in MoDs, and other organizations in the public security domain, can be explained and established.

1.5. Societal relevance

The findings of this research will provide for a better practical understanding of how institutional factors can stimulate open data success. Political parties, MoDs, and other ministries, who are interested in improving the institutional structures for open data implementation can learn from the lessons that are provided in this research. The ongoing demand for open data from society will also reflect upon MoDs, which is why MoDs should find an adequate response to the civic interest in their information and data. In this research, it will be explained which institutional factors have the greatest effect on establishing open data in MoDs. In this way, MoDs can prepare themselves to set-up the right conditions for establishing open data.

In addition, this paper also shows how three different MoDs are currently are choosing to provide open data. MoDs who are struggling to see what data can be of public value can have a look at the datasets that are provided in other countries. This research provides an extensive analysis of types of data that can be published by the MoD, without having detrimental security or privacy risks.

Policy-makers who are interested in the precise data that is provided by fellow MoDs can take inspiration and apply it in their work to create more open data.

1.6. Reading guide

The outline of this thesis is as follows. In the following section, the theoretical outline of the thesis will be presented. This will be done through a variety of steps. First, this paper aims to explain why open data in MoDs is important to study (chapter 2.1., 2.2.), how it can be conceptualized (chapter 2.3.) and why it such a paradoxical concept (chapter 2.4.). What follows is a discussion about how open data in MoDs can be explained by three institutional factors: policy and strategy, legislation, and organizational arrangements (chapter 2.5.). To conclude the theoretical outline, the theoretical model will be summarized in chapter 2.6.

In the methodology it will be described how this research is performed. This will be done by providing more information about the research approach (chapter 3.1.), case selection (chapter 3.2.), the methods applied (chapter 3.3., 3.4.), and how validity and reliability is maintained (chapter 3.5.). In the results section, each country will be assessed separately for both the institutional factors and the open data-assessment (chapter 4.1., 4.2., 4.3.). This will be followed up by a chapter that explains more about the comparison between countries and the relationship between institutional factors and open data in MoDs (chapter 4.4.). In the discussion, the theoretical and practical implications will be discussed (chapter 5.1., 5.4.), just like the methodological limitations and avenues to advance the theoretical model (chapter 5.2., 5.3.). Lastly, the conclusion will be presented (chapter 6).

2. Theory: towards an understanding of open data in MoDs

2.1. The premise of open data

The open data initiatives that have arisen since the 2000s are numerous. In public administration, the rise of open data initiatives can be understood from the wider attention from governments towards establishing trust and transparency (O'Hara, 2012). In the OGP (2020), 79 countries currently commit to making concrete plans about how to improve governmental transparency. This move towards transparency and open data is further stimulated by civil society organizations. Estimates of NGOs that exist to encourage and monitor transparency globally are around 500 (Sunlight Foundation, 2013). In this open government movement, open data can be considered an important flagship that contributes substantially and symbolically to creating more open governance.

The main premise behind open data from governments is that is able to improve accountability and that it can lead to more participatory governance (Attard et al., 2015). It enables citizens to monitor what governments are doing and question the legitimacy of government actions, providing an opportunity to exercise social control. It may also increase the opportunities for citizens to participate in the governance processes (Ruijer et al., 2017). Non-governmental actors can use open data to provide insights to inform policies. In addition to these premises, open data is also considered beneficial for economic growth, business innovations, and public sector efficiency (Janssen & Estevez, 2013). The value of the data that is generated by the government can help business organizations to grow and governments to become more efficient. In other words, the data informs a more efficient organization and production of public services. The democratic and economic premises underlying open data sometimes can sometimes battle with other interests, such as the political sensitivity of certain data or the security and privacy risks that are involved (Barry & Bannister, 2014). There is a great variety of contextual factors that come into play when a governmental organization tries to accomplish ambitions from open data initiatives. This is why the next chapter details further why it is important to understand the policy context in which open data initiatives are applied.

2.2. Open data in policy context

The extent to which open data initiatives achieve their democratic and economic goals depends on the context in which it is applied (Safarov et al., 2017). Recent findings suggest that transparency of open data is more easily provided in “harmless” policy domains (Ruijer et al., 2019). Issues that are high on the political agenda, and are accompanied by many uncertainties, can hinder policy-makers to provide more open data transparency. The fear that external stakeholders will purposively try to misinterpret or manipulate the data against the public interest is reinforced when dealing with contested issues (Barry & Bannister, 2014). It is, therefore, important to study the differences of open data implementation in different policy domains (Ruijer et al., 2019).

The value of open data is well researched in policy domains like infrastructure and urban governance. Examples of open data utilization in cities are found in Rio de Janeiro, Amsterdam, Chicago, Manchester and Rome, where open data projects are applied in policy domains like air pollution, energy and mobility (Janssen, Matheus & Zuiderwijk, 2015; Kassen, 2013; Veeckman & van

der Graaf, 2015; Volpi, Ingrosso, Pazzola, Opromolla & Medaglia, 2014). Cities challenge themselves to become *smart cities* and open data initiatives are seen as a way to achieve this goal (Ojo, Curry & Zeleti, 2015). Other policy domains that generally spark the interest of open data initiatives are related to health, the monitoring of elections, or governmental budgets (cf. Martin, Law, Helbig & Birkhead, 2017; Dos Santos Brito, da Silva Costa, Garcia & de Lemos Meira, 2015; Ruijer et al., 2019).

The application of open data initiatives in all the aforementioned policy domains share that they are applied in settings with relatively low security risks. In these policy domains, privacy standards do play an important role and can form an important risk for the successful implementation of open data (Graux, 2011; Scassa, 2014). Privacy regulations prevent personal data from citizens and employees to come out without a clear need or purpose. The issue of security, however, touches upon another important element. Actors with unwelcome intentions can actively search for information to achieve illegal goals.

In policy domains such as defense and policing, the importance of both security and privacy considerations are strengthened. National security agencies are specifically designed to combat illegal practices or opponents in international relations. To the knowledge of this study, the open data literature lacks empirical research towards the possibility of open data initiatives in this sector, especially when it comes to defense-related data. A rare exception is provided by Whitmore (2014) who explored the opportunity to predict wars based on the spending activity of the US Department of Defense (D.O.D). This paper aims to contribute to this lacuna in the open data literature, by exploring how open data initiatives have crystalized in the MoDs in the UK, US and the Netherlands. In the next chapter it will be more clearly defined what is meant with open data in MoDs.

2.3. Open data in MoDs – a definition

This research highlights two different aspects as critical for assessing the open data provided by a ministry. The first aspect relates to the degree of information and the second to the degree of openness. More information about the theoretical relevance of each aspect is explained in the next chapters.

2.3.1. Amount of information

The amount of information that is provided with open data can be an important indicator for understanding the strength of open data in a government or organization. This assumption underlies many of the most renowned open data indexes about open data provision on a national level (GODI, 2017a; Open Data Barometer, 2017). In the GOI index, it can be observed that open data fourteen policy categories are researched. For each policy category, the GOI Index checks whether relevant amounts of information is available. For example, for the policy category ‘budget’, it is researched whether all governmental agencies and sub departments publish budget information. Here the assumption is that more detailed budget information leads to a better open data assessment. Similarly, the Open Data Barometer uses the ‘existence’ of datasets in various policy categories as an important indicator for open data assessments. This paper is inspired by both the GOI and the Open Data Barometer and acknowledges that grading the amount of information in different policy categories is

also crucial for understanding open data in MoDs. More information about relevant policy categories within the MoD can be found in chapter 2.3.4.

2.3.2. Degree of openness

The degree of openness is at the heart of every definition of open data. The 'open definition' refers to open data as 'data that can be freely used, re-used and redistributed by anyone - subject only, at most, to the requirement to attribute and sharealike' (OKF, 2020). Another more precise definition from the Sunlight Foundation (2010), which states that open data must comply with ten principles: complete, up-to-date, first-line, accessible, machine-processable, non-discriminatory, permanent, license-free, without property rights and free of charge. All the different elements that are mentioned in this definition can be reduced to three different dimensions: the economic, legal, and technical dimension of open data (De Hoog, van Twist, Meijer, van der Steen & Scherpenisse, 2012). Data is technically open when the data is machine-readable and can be used without any restrictions. Legally open refers to the condition that data is licensed to be used by everyone. For example, the Creative Commons (2020) offers licenses that enable for legal copy, use or distribution of creative or academic work. Economically open refers to data that is freely accessible for its users, notwithstanding the potential costs of collecting, managing and keeping the data public (De Hoog et al., 2012).

2.3.3. Open data and proactive transparency

Contrary to popular belief, open data is not always the result of proactive transparency. Following the definitions as presented in chapter 2.3.2., it can be inferred that initially requested datasets can become 'open' as soon as the data meets the technical, legal and economic conditions of openness. Therefore, this study emphasizes that it considers the proactive transparency of government data in MoDs. Most scholars interested in transparency in MoDs have focused on the passive disclosure of information (cf. Roberts, 2006; Colaresi, 2014), without considering the potential implications of proactive disclosure of MoD data. Proactive disclosure refers to information that is made public at the initiative of a government body, without a request being filed (Darbishire, 2010). Building upon this understanding of proactive disclosure, and the relevance of degrees of information and openness, this paper formulates the following definition of open data in MoDs: "All data that is held by the MoD and that is proactively disclosed for everyone while simultaneously meeting with the legal, technical, and economic conditions of open data". This definition shows that this study is interested in all MoD open data, which enables for an encompassing assessment of open data in variety of policy categories. Therefore, the following chapter details further which types of MoD open data can be considered.

2.3.4. Open data in MoD-specific and ministry-wide policy categories

To obtain an understanding of open data in MoDs, it is important to contextualize what information is held in MoDs. To the knowledge of this study, the literature provides a limited conceptual understanding about publicly relevant MoD information. Therefore, inspiration is taken from a NGO: Transparency International (TI) Defence & Security. This organization provides the Government Defence Integrity Index which aims to assess levels of corruption in MoDs (TI Defence & Security, 2020). The GDI assesses, in particular, the provision of political, financial, personnel, operational, and

procurement information, as these policy categories contain higher risks for corruption. There are currently 20 countries for which the GDI assessment is completed, and a common finding is that the least transparency is provided about operational information (Ibid, 2020). This research aims to build upon the policy categories that have been conceptualized in the GDI but is interested in all open data that is provided by MoDs.

To investigate all open data that is provided by MoDs, this research distinguishes between open data in MoD-specific policy categories and open data in ministry-wide policy categories. Open data in MoD-specific policy categories relate to specific information about soldiers, their activities, and their equipment. This type of information is only produced by the MoD and, therefore, only MoD specific policies, legislation or organizational arrangements can be of influence on this open data. In contrast, data in ministry-wide policy categories relates to information that is also produced by other ministries. Examples of data in this category are budget and procurement data. The transparency of this type of data can both be influenced by MoD specific and national policies, legislation, and organizational arrangements. Research has shown that especially national (ministry-wide) policies, legislation and organizational arrangements can influence the provision of open data (cf. Safarov, 2019), but this understanding is lacking for policies and organizational arrangements from the MoD. Thus, the difference between open data in both policy categories is especially important to consider[2], because this research is interested in explaining open data with both national and MoD specific institutional factors. In this way, this research is able to distinguish the effect of each institutional factor, while simultaneously considering all open data that is provided in MoDs. The next chapter details further what the literature considers the advantages of openness and secrecy in MoDs. As such, more context is provided about why MoD data, in both MoD-specific and ministry-wide policy categories, is considered a contested phenomenon.

2.4. Defense transparency: balancing between secrecy and openness

Defense transparency is about finding a balance about the need for secrecy and the possibility of openness of information. Part of the work of militaries and security agencies is to surprise or outperform the opponent; a strategic goal that is at first sight at odds with disclosing strategic information (Colaresi, 2014). The enthusiasm surrounding transparency policies is therefore commonly not shared among the collection of departments and agencies who are dealing with defense, intelligence, and policing (Roberts, 2006). MoDs have also shown that they are unwilling to cooperate with transparency efforts or, more specifically, the implementation of transparency laws (Brown, 2015; Worthy, 2017). All these findings suggest that the need for secrecy in MoDs is very strong. Nevertheless, the literature does show that there are potentially a variety of arguments either in favor of more openness and in favor of more secrecy. Four main arguments in favor of openness and secrecy will be discussed below.

[2] See for a more detailed discussion about the difference between both policy categories chapter 3.4.1.

2.4.1. Advantages of defense transparency

The literature on defense transparency suggests a variety of reasons to strive for more defense transparency. A first argument originates from the international relations and war literature, which argues that conflict arises out of misconceptions about the strength of the enemy (Lindley, 2007; Van Evera, 2013). The principle is that when the strength of your negotiation position is completely clear to all relevant stakeholders, there would be no need to settle disagreements with violence as everyone would be able to foresee what the result of this would be. From this perspective, transparency in MoDs will reduce tensions and promote peace between nation-states.

A second argument stresses the importance of transparency in MoDs from a democratic accountability perspective (Rodrigues, 2017). It is important for MoDs to receive support and trust from society, as it is their goal to protect citizens. Support and trust can be increased if citizens are able to assess the capabilities and activities of MoDs. Providing accountability is also one of the main reasons why open government data is established (Attard et al., 2015). It provides opportunities for citizens to exercise control over the actions of the government, and this can also enhance governmental legitimacy. This is especially important in the defense-sector, where impactful decisions on people's lives are made.

The third argument is in line with the democratic accountability argument and stresses the importance of taking anti-corruption measures. It is a misperception that developed countries are immune to corruption, especially in the policy domain of defense (Perlo-Freeman, 2018; 2019). The defense sector is especially vulnerable to corruption because of the high amount of secrecy that is involved. This element, combined with the enormous complexity and economic value of many defense projects, provides for an ideal mixture of ingredients that can lead to illegal practices (TI Defence & Security, 2020). The World Peace Foundation (2020), has highlighted that there are various cases of arms trade corruption occurring in developed countries like Germany, the US, the UK, and Austria. This suggests that the need for transparency and integer accountability is an issue that requires attention in the context of MoDs.

The fourth argument that is provided for transparency in MoDs is related to the business/economic growth opportunities. After a study of three conferences where industry, the MoD, and academic experts meet, Thompson & Louth (2019) showed how transparency is an underlying logic that informs the language of cooperation between businesses and MoD officials. The information that MoDs share can be utilized by the defense industry to provide better equipment or services; thus contributing to the effectiveness and efficiency of the defense sector as a whole. Furthermore, historical research shows that the development of high technology industries highly correlates with the amount of public spending attributed to the defense sector (Breheny & Mcquaid, 2018). This also suggests that transparency by MoDs can lead to valuable economic innovations in society..

2.4.2. Advantages of defense secrecy

Now that the most vital arguments in favor of defense transparency are summarized, it is time to take a look at the potential risks of defense transparency. In the literature on international relations and war studies, there are divergent stances on the desirability of transparency. A dominant line of research opposes the view that transparency leads to peace-keeping (Finel & Lord, 1999; 2002; Rosato,

2003). A first argument against defense transparency is that it leads to diffuse and often contradictory information messages to opposing states, leading towards confusion about the authoritative stance of the state's policy (Finel & Lord, 1999; 2002). The uncertainty that is met with transparency can, from this perspective, only lead to more unpredictable government actions. This also highlight the second argument for defense secrecy. This argument emphasizes that opponents of democracies, in practice, and aim to misuse information that is provided by governments (Rosato, 2003). This can put the safety of the MoD and citizens at danger.

A third argument for defense secrecy emphasizes the importance of maintaining security from a competitive standpoint. An early advocate of transparency Jeremy Bentham (1791), already proclaimed in his *Of Publicity* that some exceptions to the rule of publicity should be taken into account; one of them being the case in which it can strengthen the position of the enemy. In addition, Colaresi (2014) convincingly shows in various examples, that secrecy provides an advantage in the competitive international politics of war and conflict. In the hypothetical case that democracies would be fully transparent, this could put them at risk when battling against anti-democratic states. To counter this risk, all democracies have rules to allow executives to designate information as secret (Ibid, 2014).

The fourth argument relates to the importance of privacy regulations. The literature on open data transparency suggests that various privacy risks should be taken into account (Graux, 2011; Scassa, 2014). It is critical that open data cannot be traced back to individuals to preserve the rights of citizens and employees. This might especially be the case in the MoD, where the interests of military personnel are protected against potential opponents.

Table 1. Balancing between defense transparency and secrecy

Arguments for openness	**Arguments for secrecy**
Prevents misconceptions between states	Prevents misconceptions between states
Improves democratic accountability	Prevents misuse of information by opponents
Prevents corruption	Provides competitive edge over opponents
Leads to economic growth / innovation	Preserves privacy of individuals

2.4.3. Managing the paradox of defense transparency

As can be concluded from the variety of arguments in favor of either defense transparency and secrecy, the issue of defense transparency is highly complex in nature. Defense transparency can be considered an inherently paradoxical concept, as 'the metaphor conveys unproblematic revelation of true information, and yet in practice, it takes a lot of institutional and political work to achieve a credible relevant relationship between the receiver of information and whatever the information is about' (Lindsay, 2011, p. 2). This definition of defense transparency as a paradox shows that releasing defense information is in of itself a contested phenomenon. The afore discussed advantages of transparency and secrecy also show that the issue of releasing defense-related information can be informed by many reasons. Defense transparency can contribute to peace-keeping, public accountability, mitigating

corruption, or increase economic value, while at the same lead to misconceptions between states, the strengthening of opponents positions and provide risks for the privacy of citizens and MoD employees (see table 1).

This is why nuanced and context-sensitive approach is needed when dealing with any type of governance that deals with national security information (Colaresi, 2014; Roberts, 2006). This paper has now conceptualized what open in MoDs is about and why it is such complex and paradoxical concept. To make understandable how the governance context can explain open data in MoDs, this study will take up an institutional approach. The next chapter details further why this institutional approach is taken, how it is applied, and explains which theoretical model governs the remainder of this paper.

2.5. Explaining open data in MoDs – an institutional approach

The conditions under which open data transparency is utilized are diverse: the quality of the data, legislation, policy, skills, infrastructure, availability and privacy are all elements that can influence the success of open data (Safarov et al., 2017). These conditions can be divided across social and technological dimensions (Yang & Wu, 2016). On the one hand, there are technological conditions which are related to the quality and accessibility of the data. On the other hand, there are social conditions that are influenced by the organizational set-up and the ideas and rules that govern the disclosure of open data. It is argued that especially the 'social' dimension of open data realization can be considered complex and, therefore, difficult to address (Safarov, 2019).

Transparency research shows that theories of institutionalism provide a viable means to explain the social behavior of actors involved in transparency efforts (cf. Ruijer & Meijer, 2016; Safarov, 2019; Rodrigues, 2017). In their study regarding the transparency regimes in the Netherlands and the USA, Ruijer & Meijer (2016) show that historical and institutional differences can explain differences in rule-based and principle-based approaches towards transparency in two different countries. Institutional theories are also used to analyze defense transparency towards citizens. Rodrigues (2017) shows in her dissertation how differences in 'transparency of records' from MoDs in Mexico and Brazil can be explained by applying Mahoney & Thelen (2010) theory of gradual institutional change. Institutional theories are also useful for understanding open data utilization. Safarov (2019) applies a broad definition of institutionalism and distinguishes five different institutional factors that influence the rate of success for open data: policy and strategy, legislation, organizational arrangements, skills and public support, and awareness. The aforementioned articles all provide inspiration for the institutional approach that is taken up in this study.

Transparency and open data are built upon a long history of institutional change, that can even be traced back to ancient times (Meijer, 2015). As such, it is important to consider how open data in MoDs is influenced by institutional factors. Therefore, this study grounds its explanation for open data in MoDs in discursive institutionalism (Schmidt, 2008). This theoretical perspective has influenced Safarov (2019) institutional approach that is also taken up in this study. Discursive institutionalism is about explaining the emergence of policy-ideas, discourses and institutions (Schmidt, 2015). It pays specific attention to the ideas that are generated and contested by relevant actors and provides a means to look at the way actors interpret and apply policy tools, legislation and organizational

resources. Thus, this study deliberately focuses on three out of the five institutional factors as presented by Safarov (2019): policy and strategy, legislation and, organizational arrangements. These three factors are able to influence the successfulness open data implementation. The next paragraphs details further what each factor entails and how it potentially contributes to open data in MoDs.

2.5.1. Policy and strategy

The theoretical framework, as developed by Safarov (2019), looks at the presence of policy and strategy as a factor to explain the strength in open government data. An encompassing strategy that informs the process of open data implementation, can be the first important step to generate impact (Jetzek, 2016). A strategy can provide insights into what open data can do and why it's worthwhile to facilitate open data information structures. Moreover, the presence of policy guidelines is important to instruct employees about how open data should be published (Zuiderwijk, Janssen, Choenni & Meijer, 2014). This will equip open data providers with the right expertise to serve the interests of both providers and users. This can especially be important when security and privacy considerations should be taken into account, which is why guidelines are expected to be of importance for providing open data in MoDs. Strategies or guidelines on open government data might be articulated in reviews, policy documents, or white papers that are either produced by the MoD or other ministries.

2.5.2. Legislative foundations

It is important to have a look at the extent to which legislation impacts the way transparency is provided. The way the FOI, and other laws, encourage proactive transparency should be taken into account for obtaining a greater understanding of open data implementation in MoDs (Safarov, 2019). Legislation can set the conditions under which open data is provided (Yang, Lo & Shiang, 2015). However, legislation can also be an important barrier for the establishment of open government data due to security and privacy provisions (Janssen, Charalabidis & Zuiderwijk, 2012). In the context of defense transparency, the exemption rights in freedom of information (FOI) laws are often used to dismiss requests for more transparency (Colaresi, 2014). This should also be considered when trying to explain open data transparency in a transparency-averse organization.

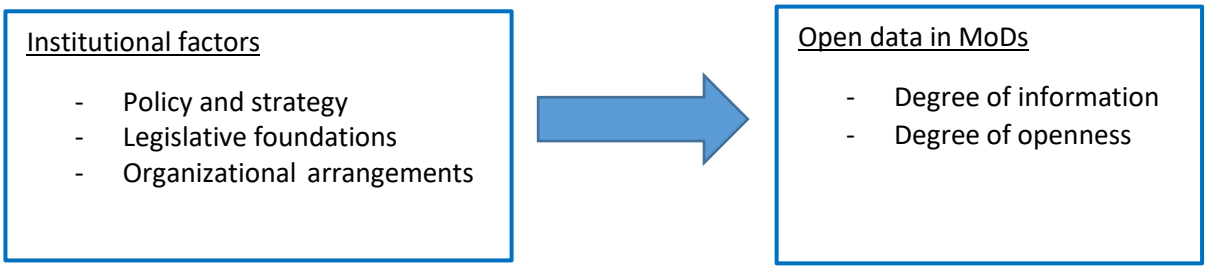
2.5.3. Organizational arrangements

The way organizations are organized can also be a crucial factor in explaining the extent of transparency provided. The OECD (2018) states that it is preferable to establish a central institution that is responsible for establishing open data policies. This centralized organization can provide a clear strategy agenda and should link open data practices with public sector innovations. Furthermore, it is important to coordinate open data initiatives and provide means to standardize processes (Zuiderwijk & Janssen, 2013). Therefore, it is important to provide sufficient organizational resources for open data implementation. In this way, an efficient and reliable way of providing open data can be established.

2.6. Theoretical model

Figure 1 provides the theoretical model that is at the heart of this research. The ambition of the theoretical model is to explain differences in open data implementation in MoDs of different countries. To assess the strength of open data in MoDs, this study looks specifically at the amount and degree of open data that is provided. In this way, a comprehensive analysis can be performed to assess open data provision on an organizational level. Furthermore, this research expects all three institutional factors to have an influence on open data in MoDs (see also chapter 2.5.1, 2.5.2, 2.5.3). Policy and strategies are important to create awareness among policy-makers and can provide instructions that make the provision of open data more efficient. Legislative foundations can require organizations to publish certain information and provide it in an open-format. In addition, organizational arrangements can be important in establishing resources and motivations to publish open data. Thus, the underlying assumption behind the theoretical model is that stronger open data policies and strategies, legislation, and organizational arrangements will lead to better open data implementation in MoDs.

Figure 1. Theoretical model



3. Methodology

3.1. Research strategy

The research strategy in this study is to analyze three different cases to explore the relationship between institutional factors and open data in MoDs. Small N case studies enable researchers to explore relatively unknown research areas (Yin, 2003). This strategy is especially suitable, because studying open data practices within MoDs (and the national security sector) is a relatively undiscovered research area. Therefore, this focus on obtaining an explorative knowledge about open data in MoDs. The strength of a comparative case-study with a small N, is that the scope of proposition goes deeper than in Large N studies (Gerring, 2006). As such, this research will enable for a rich understanding of the causal mechanisms that come in to play when establishing open data in various countries and organizations. As such, this research aims to provide theoretical knowledge that can lead to 'possibilistic generalization' (Blatter & Haverland, 2012). With possibilistic generalization, conclusions can be drawn from the potential influence of a set of related causal factors. As such, this study provides insights into the influence of institutional factors on open data in MoDs that can possibilistically be of relevance in other MoDs and ministries.

The method that is used to obtain a rich understanding of the relationship between institutional factors and open data in MoDs is causal-process tracing. Causal process-tracing (CPT) is a technique that is focused on the 'Y' variable and builds upon the notion that the outcome in 'Y' is determined by a complex set of context-dependent factors (Blatter & Haverland, 2012). This research looks at three factors that can potentially explain a high amount of variance in open data implementation: policy and strategy, legislation, and organizational arrangements. The aim of the research is to contextualize the effect of each factor and to determine which factors are most influential. With this approach, this study builds upon the work in *Security Studies* literature (Tannenwald, 2015), that have applied methods of process-tracing to increase understanding about the causes of war, military intervention and nuclear decision-making (cf. Sagan, 1993; Tannenwald, 2007; Van Evera, 2013; Saunders, 2011). All these studies bring attention to the processes that have led to certain situations or decisions in the defense sector. In a similar fashion, this research aims to provide a better understanding of the institutional processes leading to open data in MoDs. The next chapter details further which steps have been taken to create a complete picture.

3.2. Case selection

The most important case selection principle when applying CPT is the accessibility to obtain relevant information (Blatter & Haverland, 2012). Only by analyzing sufficient empirical information, it can be claimed how a set of institutional factors influences the outcomes in a dependent variable. Following this principle of accessibility, this research has selected the MoDs in the Netherlands, the United Kingdom, and the United States as cases to investigate. These three countries can provide insightful information about open data in MoDs for two different reasons.

First, the Netherlands is chosen because of the accessibility to easily approach potential interviewees and access relevant policy documents. The Open State Foundation is in close contact with

officials of the Dutch MoD and has acted as a connector to provide more information. In addition, the UK and US were chosen based upon their high scores in open data transparency benchmarks about differences between countries (GODI, 2017a; Open Data Barometer, 2017). It is hypothesized that open data in MoDs is less likely to be found than in other policy domains (see chapter 2.2.). Based on this consideration, this paper chooses to select MoDs in countries where open data is most likely to be found. The UK ranks 2th in both the GODI (2017a) and the Open Data Barometer (2017), whereas the US ranks 11th and 9th, respectively. Moreover, both countries have been frontrunners during the start-up of the open government movement; acting as founders of the OGP in 2011 (OGP, 2020). As such, the participation of the UK and US in open data initiatives on a national level suggest that they are 'most likely' cases to provide sufficient information about open data in MoDs.

3.3. Methods institutional factors

3.3.1. Operationalization

In this study, three different institutional factors are used to explain open data in MoDs: policy and strategy, legislation and, organizational arrangements. This categorization is inspired by Safarov's (2019) work on institutionalism and open data. His operationalization of institutional factors was applied to a national context and, therefore, cannot be applied in the context of MoDs. The criteria are adjusted following an iterative process, including reflection on theoretical insights and empirical observation. As a result, the final criteria are inspired by Safarov's operationalization of institutional criteria (2019) and refined after empirical analysis of policy documents and interview transcripts. For each institutional factor, multiple criteria are set out to determine the strength of each institutional factor. The strength of each criterion can vary from weak, moderate to strong. A full overview of the criteria can be found in table 2 and is explained below.

3.3.1.1. Operationalization policy and strategy

Three criteria are used to determine the strength of policies and strategies within each MoD: strategy, guidelines and plans, and participation in national policy initiatives. Strategies and guidelines can be of great importance in establishing establishing open data in governments (Dawes & Helbig, 2010; Zuiderwijk et al., 2014), which is why the existence of these types of documents are used as criteria. In addition, it is looked at to what extent the MoD participates in national policy initiatives. Open data policies can be steered by centralized authorities that oversees the open data efforts in other ministries (Safarov, 2019). If the MoD participates in these national initiatives, it can be considered an indicator of strong policies and strategies.

3.3.1.2. Operationalization legislation

Legislative criteria are selected based upon findings that distinguishes legislation as an important driver for successful open data (Huijboom & Van den Broek, 2011; Toots, Mcbride, Kalvet & Krimmer, 2017). A division is made between the strength in legislation on information and open formats. Legislation about information relates to the actual content that should be published. A common example of this is the annual budget. Legislation about open formats relates to how the information is

published. For example, it can be legislated that data should be published in a machine-readable format.

3.3.1.3. Operationalization organizational arrangements

This study takes a look at the organizational arrangements in terms of its formal meaning. Two criteria are considered. The first is about the existence of a stimulating or supervising authority. Previous research has shown that the positioning of a supervising governmental agency can influence better open data performances (OECD, 2018). In addition, it is looked at how open data is delegated as a task within the MoD. The expectation is that the embeddedness of open data as an organizational task is likely to lead to more and better open data provision.

Table 2. Institutional criteria

Policy and Strategy	**Weak**	**Moderate**	**Strong**
Strategy	There is no specific strategy related to general transparency or open data activities, commitments or goals.	There is a specific strategy document related to general transparency activities, commitments and goals.	There is a specific strategy document related to open data activities, commitments and goals.
Guidelines and plans	There is no specific guideline / plan on providing transparency and disclosing open data.	There are guidelines or plans about how general transparency efforts need to be executed.	There are specific guidelines or plans about how and what open data will be disclosed.
Participation in national open data policies	'Exception role' regarding national/ministry-overarching open data initiatives.	The MOD takes part in national/ministry overarching open data initiatives	Role as frontrunner for national / ministry-wide open data initiatives.
Legislative foundations	**Weak**	**Moderate**	**Strong**
Open information	There is no open data legislation that encourages MODs to proactively publish certain information.	There is open data legislation that encourages MODs to proactively publish information in some categories.	There is open data legislation that obliges MODs to proactively publish information in a great variety of categories.
Open formats	There is no legislation that encourages the publication of information in open formats.	There is legislation that encourages the publication in an open format.	There is legislation that requires publication in an open format.
Organizational Arrangements	**Weak**	**Moderate**	**Strong**
Supervising authority	The MoD is not encouraged or required by a governmental organization to provide open data.	The MoD is stimulated to provide open data by a fellow ministry.	The MoD is required by a higher authority to publish open data.
Delegation of open data as a task	There are no officials in the MoD who are responsible for open data.	Officers only hold open data as a side task in their portfolio.	Officers hold open data as main task in their portfolio.

3.3.2. Data-gathering

This research relies on interviews and document analysis to obtain more insights into the strength and influence of each institutional factor. Document analysis is performed on governmental policy documents about transparency and open data on the national and MoD level. Moreover, other secondary literature such as news articles, applied research papers, and legislative documents are consulted to further validate the propositions that arise from the analysis. An overview of documents used in this study can be found in Appendix 1.

Interviews are conducted with academic experts and practitioners within the MoD and other relevant ministries. In total, thirteen interviews have been conducted mostly online or via the phone. Interviews were conducted with different purposes. The interviews with academic experts were primarily focussed on contextualizing national changes in transparency policies, legislation, and organizational arrangements. The interviews with policy-makers or advocates were primarily focussed on gaining insights about MoD specific transparency policies, legislation, and organizational arrangements. Permission was asked to record the interview, so as the possibility to share an abstract (anonymized) profile of the interview in this research. Table 3 shows an overview of the professional background of each interviewee.

Table 3. Interviews

Position	**Type of interview**
1. Statistician MoD UK	Interview about MoD (open) data
2. Statistician MoD UK	Interview about MoD (open) data
3. Academic expert transparency UK	Interview about general transparency policies in the UK
4. Policy advocate NGO NL	Interview about collaboration with the MoD
5. Policy officer Open Data NL	Interview about national open data policies
6. Policy officer MoD (NL)	Interview about MoD (open) data
7. Policy officer MoD (NL)	Interview about MoD (open) data
8. Policy officer MoD (NL)	Interview about MoD (open) data
9. Policy Advocate NGO (UK & US)	Interview about collaboration with MoDs in the UK and US
10. Researcher from Transparency International (TI) (US)	Interview about information gathered via the Government Defense Integrity Index 2020
11. Policy Advocate NGO (US)	Interview about collaborations with the DoD and its efforts on transparency and open data.
12. Academic expert transparency (US)	Interview about transparency policies in the US
13. Academic expert transparency (US)	Interview about transparency policies in the US

3.3.3. Data-analysis

Each relevant policy document and interview transcript is coded by a procedure of deductive coding. A deductive approach of coding is guided by already established theoretical concepts and expectations (Boeije, 2016). The topic of each institutional criteria is used as a theoretical searchlight to obtain more information about the strength of each institutional factor. Relevant segments or statements were then attached to each institutional indicator as a source to further justify the judgment on each indicator. Appendix 1 provides a full overview of all secondary literature sources that have been used to support each classification.

Subsequently, the method of CPT was applied to gain insights into the influence of each institutional factor on open data in MoDs. This method relies on three empirical foundations: comprehensive storylines, smoking guns, and confessions (Blatter & Haverland, 2012), which are all applied in the results section. In chapter 4.4., a comprehensive storyline is provided about the influence of each institutional factor by bringing together how different indicators influence open data in MoDs. This comprehensive storyline is validated by the observation of "smoking guns", which provide crucial evidence for the validity of a certain effect from X on Y. This can, for example, relate to a specific mandate, piece of legislation, or a reorganization that contributes to outcomes of open data in MoDs. The last empirical fundament relates to confessions, which reveals the perceptions of relevant actors. These are included via quotes or references in the text.

3.4. Methods open data in MoDs

3.4.1. Operationalization open data in MoDs

To assess the strength of the data that is provided by MoDs, this paper considers different categories of data that are provided by each MoD. The policy categories that have been selected are either MoD-specific or ministry-wide. Ministry-wide information is about types of data that can also be produced by other ministries. This is the case for the following data categories: budget, spending, procurement, geography, and legislation (GODI Index, 2017b). MoD-specific types of data can only be produced by the MoD. The MoD-specific categories that are considered are: personnel information (MoD-specific), health & medical information, veterans and equipment and activities of the armed forces. These categories have emerged as relevant themes during the research.

The goal of this research is to classify the strength of open data in each category. The strength assessment in each category is based upon: a) the amount of information that is provided, and b) the openness of the datasets. The amount of information is assessed by a measure that looks at the absolute (not relative) amount of datasets that is available. Categories can provide 'none', 'some', 'substantial', or 'many' amounts of information in this analysis. More information about the amounts of datasets per information category can be found in table 4.

Table 4. Amount of information per policy category

Amount of information	Amount
None	0 datasets
Some	1 – 5 datasets
Substantial	5 – 30 datasets*
Many	30 datasets and above*
** If 1 dataset contains an amount of information that is equivalent for more datasets, this will be taken into account and explained in the results section.*	

The openness of datasets in each category is based upon an analysis of individual datasets provided by each MoD. The individual datasets are assessed by a set of questions corresponding to the legal, technical, and economic conditions of open data transparency. These questions are derived from the GODI Index who uses the same assessment tool grade individual datasets (GODI, 2017b). Each question corresponds to a yes or no answer for which points are given. Following from these set of questions, datasets obtains a score between 0 and 100. An overview of the questions can be found in table 5.

Table 5. Openness assessment of individual datasets

Type of open data condition	Indicator assessment
Technical	Is the open data available without registering or request? (15p)
Economical	Is the data available free of charge? (15p)
Technical	Is the data downloadable at once? (15p)
Technical	Is the data up-to-data? (15p)
Legal	Is the data openly licensed? (20p)
Technical	Is the data in open machine-readable formats? (20p)

From the quantifiable score follows an individual categorization about the 'openness' of the data. The data can be graded as 'open data', 'public data (high)', or 'public data (low)'. For more information regarding the meaning of each grade, please find table 6. To assess the openness of the datasets for aforementioned policy categories, it will be looked at which type of openness is applicable to the majority of datasets. In other words, the 'modus' categorization of individual datasets is taken as an indicator of openness per policy category.

Table 6. Types of openness for individual datasets

Type of openness	Description	Maximum Score
Open data	Open data can be freely used, modified, and shared by anyone for any purpose. Main criteria is machine-readability and the ability to download without restrictions. In some instances, no confirmation can be found about the public license, which can explain a score below 100%	80 - 100%
Public data (high)	Data is public (high) if it can be seen by the public online without any restrictions (e.g. access controls). Main criteria: the data should still be downloadable, but is not necessarily available in open, machine-readable format (example: excl. files). In some instances, no confirmation can be found about the public license.	60 - 80%
Public data (low)	Data is public (low) if the relevant information can be found online without restrictions. Main criteria: the information is provided in pdf-files or is not downloadable at all.	15 – 60%

To assess the overall strength of the proactive data provision in MoDs per policy category, this paper brings together the assessments for the amount of information and the openness of datasets. In doing so, five different scores can be obtained: very weak, weak, moderate, strong, and very strong. An important indicator is the absolute amount of information that is provided (see table 4). In addition, the openness of the data is taken into account (see table 6). The empirical analysis shows that when 'higher amounts of information' are present, the modus of the data correspondingly becomes 'open data' or 'public data (high)'. The only exception for this is provided with legislative information, which can also be provided sufficiently in non-open format. Therefore, no weaker score can be derived from having substantial or many amount of information with a simultaneous modus of public data. See for more information about the open data assessment per policy category table 7.

Table 7. Open data assessment per policy category

MoD Open data assessment per category	Very Weak (--)	Weak (-)	Moderate (+-)	Strong (+)	Very Strong (++)
Amount of information	None	Some	Some	Substantial	Many
Openness of data	None	Public data (low)	Public data (high)	Open data/ Public data (high)	Open data/ Public data (high)

3.4.2. Data-gathering

The datasets are obtained from a variety of online sources. Datasets from ministries are generally shared via the national open data portal: https://data.gov.uk/ in the UK, https://www.data.gov/ in the US and https://data.overheid.nl/ in the Netherlands. In addition, datasets are provided via other online sources. Especially in the US, open data is provided via variety of additional online platforms. Via google searches and questions asked during the interviews it was validated whether all relevant online sources have been consulted. An overview of sources that have been used to grade the strength of open data in each policy category can be found in appendix 2.

3.4.3. Data-analysis

The data-analysis of open data is divided in two categories: amount of information and openness of information. The amount of information is analyzed in a straightforward manner: by counting the amount of datasets. Counting is done via manual counting if the amount datasets is not higher than 30 datasets per policy category. In some instances, the amount of datasets exceeds the amount of 30 by a strong margin. In this case, the amount of 'hits' on a specific data portal is notified as an indicator for the amount of datasets. The openness of datasets per policy category is based upon the modus of the data type (open data, high public data, low public data). However, in cases that the amount of datasets exceeds the amount of 30 per policy category, no longer all datasets can be analyzed to assess their openness. In these instances, a random sample of 10 datasets is drawn to assess the openness of the data in each policy category. An overview of all assessed datasets can be obtained in appendix 2.

3.5. Validity and Reliability

This research has applied various approaches to increase the validity and reliability of the research. Validity relates to the extent to which the measurement of a concept is in line with the meaning of the concept, whereas the reliability of the research relates to the consistency and reproducibility of the measurement of each variable (Noble & Smith, 2015). The validity and reliability can be increased via different methods, of which three are applied in this research. First, data-triangulation is used to increase the validity of the results of each institutional factor. When various sources are used to explain the strength of each institutional factor, the results are more robust. As such, policy-documents,

applied research papers, journalistic articles, and interview records have been used to validate each assessment. Second, method-triangulation is used to improve the systematic measurement of each institutional factor (Blatter & Haverland, 2012). The combination of both document analysis and interview records increases the likelihood that the measured strength of each institutional factor corresponds to the 'true value' (validity) and that other researchers will find similar results (reliability) (Noble & Smith, 2015).

To increase the validity and primarily the reliability of the open data assessment this paper has asked two experts from the Open State Foundation to replicate a sample of the analysis for each country. Experts were asked to answer the questions as described in table 5. The answers were then compared with the authors' findings, and the percentage of similar open data categorizations was taken as a measure of inter-code reliability. For the Netherlands and the UK two experts analyzed 10 different datasets, thus 20 in total. For the assessment of the Netherlands, the inter-code reliability corresponded to a percentage of 85%, while in the UK it corresponded to a percentage of 95%. For the US, one expert was asked to replicate a sample of datasets, leading correspondence in answers of 90%. These inter-code reliability scores suggest that the data-assessment consistently, and accurately, measures the openness of each dataset.

4. Results

4.1. United Kingdom

4.1.1. Policy and Strategy

On the national level, the UK can be considered one of the biggest proponents of a more open government in the last decade (cf. GODI, 2017a; Open Data Barometer, 2017). President Gordon Brown was able to put together a national platform for open data in 2010 as one of the first countries (See, 2013). In addition, the UK is one of the eight founders of the OGP, which has resulted in four national action plans on open government in the last decade (Cabinet Office UK, 2011; 2013; 2016; DCMS, 2019). These ambitious efforts from prime-minister Gordon Brown were followed by prime-minister Cameron (2010), who wrote a letter to all government departments on the 31st of May 2010. This letter made it required for central government organizations to provide transparency about spending over £25,000. Later, the Cabinet Office UK (2012) published the influential Open Data White Paper and asked all ministries to hand in their open data plans. Prime minister May (2017) later reaffirmed the importance of open data policies in a letter that emphasized the need to publish in open format. The latest national policy plans will be formulated in the National Data Strategy, which is expected to come out in 2020 under the authority of the Department of Digital, Culture, Media, and Sports (DCMS, 2020).

In the MoD, many of the open data responsibilities are placed in the Statistics Department. Interestingly, the interviewees do not experience a direct influence of policy documents, such as the national open government plans (R1, R2). Instead, the MoD statistics department is influenced by the policy initiatives from the Government Statistical Service (GSS), which is part of the Office for National Statistics (ONS). The GSS publishes primarily instructions about how to publish in open format and how to engage with users. For example, the code of practice states of the GSS states that datasets can only be withdrawn in consultation with the public (OSR, 2018):

> *"What we will do is we will review our national statistics and publications about every two years. If we want to stop publishing a certain dataset or an element of one. If we want to say people within this neighborhood, we want to remove this. Then we have to do a public consultation, and that is in our code of practice." (R1).*

This shows that the MoD participates in nation-wide open data policies or instructions. In addition, it is found that the statistics department of the MoD publishes a clear schedule of releasing information on its website (MoD UK, 2020a). Moreover, there are over 10 policy documents related to the pre-release of certain information, the quality of open data, and user engagement (MoD UK, 2019a).

However, within the entire MoD, an overarching strategy on transparency does not exist. There are several strategies related to data, which do not mention transparency as an important goal. The Defence Data Management Policy 2020 is detailed on data management from an operational perspective, and the 'Digital and information technologies strategy' 2019 puts emphasis on creating

an ‘operational advantage and business transformation’ (MoD UK, 2019b; 2020b). MoD employees also confirm that the MoD does not have an overarching strategy on transparency or open data (R1,2).

In conclusion, this paper has set out three different criteria to assess the institutional factor of policy and strategy. The first criterion relates to the existence of a strategy document that relates to transparency and/or open data. In the UK it can be found that such a document does not exist for specifically the MoD, resulting in a weak score on this indicator. The second criterion relates to the existence of policy documents and/or instructions on how the data should be published. Here it can be observed that the Statistics Department in the MoD, uses a wide variety of policy documents, instructions and ‘code of practices’ to inform how and when certain data gets published. Therefore, the second criterion is graded as ‘strong’. Thirdly, it can be observed that the MoD Statistics Department within the MoD is pressured by the GSS and their policy initiatives to publish data in open format. Therefore, this paper grades the third criterion as moderate. All in all, this provides a diverse image on the institutional factor ‘policy and strategy’, which in the end can be considered a ‘moderate’ score.

4.1.2. Legislative foundations

In the UK, it can be observed that several laws play an important role in establishing the transparency that is currently provided. The flagship is the Freedom of Information Act (2000), which enables passive and proactive transparency. From a proactive transparency viewpoint, departments are required to provide schemes about when they will release information. This scheme must be approved by the Information Commissioner’s Office (ICO) and sets out the commitment of ministries to routinely provide information about policies, procedures, minutes of meetings, annual reports, and/or financial information. In addition, the Re-use of Public Sector Information Regulations (2015) states that information should be, as much as possible, be published in a machine-readable or open format when information is requested.

Interestingly, employees within the MoD statistics department refer to another influential piece of legislation: the Statistics and Registration Service Act (2007). This Act makes statistics departments responsible for building trust in government and statistics and encourages the sharing of information with external societal actors. Although the Act does not specifically define how or which open data should be revealed, it did have a profound influence on how the MoD statistics department started sharing information. As one of the respondents said:

> *“The Statistics and Registration Act set the framework about government, this is how you are going to do it. And then there was a big push to go, gosh, we better do something then.” (R1).*

In contrast, there is a variety of legislation that enables public officials to hinder the publication of information. In the FOI Act (2000), there are several sections that exempt certain information from FOI regulations. Examples are section 24 (national security), section 26 (defence) and section 27 (international relations). In addition, there are laws that specifically aim to protect government information:

- Official Secrets Act (1989)
- Data Protection Act (2018)
- Counter-Terrorism and Security Act (2015)

The Official Secrets Act (1989) consists of four legal documents protecting the UK against espionage and the leaking of sensitive government information. It also requires government officials to sign a form of confidentiality. The Data Protection Act (2018) is an updated version of the Data Protection Act (1998) and includes instructions that stem from the General Data Protection Regulation (GDPR) from the EU (2016). It is aimed at protecting the privacy of individuals, businesses, or other organizations. Moreover, it provides opportunities for individuals to request the personal information that is held by the organization. Lastly, the Counter-Terrorism and Security Act (2015) is mainly aimed at opportunities to track travelers and, if necessary, exclude people from entering the UK. Part 3 of this law is directed at the issue of data retention; making it possible to withhold relevant internet data. Taken together, this provides a picture that shows how different laws can either contribute to the publication of open data (FOI Act, 2000; Statistics and Registration Act, 2007; Re-use of Public Sector Information Regulations, 2015) and that can hinder this process (Official Secrets Act, 1989; The Data Protection Act, 2018; Counter-Terrorism and Security Act, 2015). Remarkable is that there is no specific legislation that originates from the open data movement, of which the UK was one of the main drivers around 2010 (see chapter 4.1.1.). This suggests that aspiring the goals of the open data movement does not necessarily require or lead to new legislative foundations.

In conclusion, the strength of legislative foundations is graded by two different criteria: the extent it encourages publication in types of information and open formats. The FOI Act (2000) and the Statistics and Registration Act (2007) do encourage ministries to publish information, without requiring the publication of a certain type of information. Thus, this results in a weak score on the legislative criteria 'open information'. The second criterion looks if legislation encourages the publication of information in an open format. The Re-use of Public Sector Information Regulations (2015) states that public organizations, should, as much as possible, publish requested information in an open and machine-readable format. As a result, this paper grades the second legislative criteria as moderate.

4.1.3. Organizational Arrangements

The push towards open data was first coordinated by the Government Digital Service (GDS) in the Cabinet Office. The fact that the open data portfolio was directly under the command of the prime-minister, provided for a powerful mandate to influence other ministries to publish more open data (R3). In 2018, the responsibility for open data got transferred to the DCMS in 2018 (May, 2018). It is argued that this step has been illustrative for some of the transparency efforts that have been on the slowdown in the last five years (R3). The DCMS could be considered less powerful in terms of influencing the policies of fellow ministries.

Interestingly enough, MoD statisticians confess that they rarely collaborate with the DCMS department. Instead, the push towards open data comes from a) the Government Statistical Service (GSS), which is part of the Office for National Statistics (ONS), and b) from external stakeholders, such as parliamentarians, journalists, civil society organizations and researchers (R1, R2).

"And so as a department we would do the minimum that the GSS tell us we have to do. We do the minimum we can get away with, because we are a small team. The MoD is 350000 personnel, military and civilians. And we have a huge amount of work inside the department and that's where the department wants its analysts looking. So they (the MoD) get irritated if we say that we're not going to do some policy evaluation because we've got to release some open data. That does not go down well in the MoD. We don't have enough analysts." (R1).

This quote shows that the MoD statistics department is influenced by directives from the GSS. It is surprising that the DCMS does not have an influence, as they are formally the supervising authority on open data policies (May, 2018). One possibility is that the GSS is pushed for more open data by the DCMS, but this claim cannot be made with certainty (R2). It is interesting to see that the respondent refers to having a small team. In this team, there is one specific expert for only a subcategory of the total amount of open data that is provided. As such, it can be derived that specific open data officials or experts are working in the MoD.

In conclusion, the strength of the organizational arrangements in establishing open data is graded by two institutional criteria. The first criterion relates to the existence of a supervising authority. It has been shown that not the DCMS, but the GSS requires MoDs statisticians to publish certain data. Therefore, the criteria regarding supervising authorities is scored as strong. The second criterion measures to what extend open data is given sufficient attention by MoD employees. The MoD in the UK scores high on this criterion, as there are specific statisticians who are dealing with open data processes. A summary of scores on each institutional factor and criteria can be found in table 8.

Table 8. Assessment institutional factors UK

Institutional factor	Criteria	Score
Policy and strategy	Strategy	Weak
	Guidelines and plans	Strong
	Participation in national policy initiatives	Moderate
	Average	***Moderate***
Legislative foundations	Open information	Weak
	Open formats	Moderate
	Average	***Weak/moderate***
Organizational arrangements	Supervising authority	Strong
	Delegation of open data as task	Strong
	Average	***Strong***

4.1.4. Open data assessment UK

Most government datasets in the UK are gathered on the website data.gov.uk (2020), a website that was launched in 2010. The datasets that are published on this website are published under the 'open government license for public information'. Under this license, information can be used with the

permission to be copied, adapted, exploited, published, distributed, and transmitted, when the source is acknowledged. The analysis shows that the MoD has published a variety of data via this portal. What is interesting, is that only a small part of the data that is provided via this portal is recently updated in 2020 or 2019. Instead, the vast majority of 'open data' by the MoD is presented via the platform of the MoD department of National and Official Statistics (MoD, 2020c). Below it will be discussed how the provision of datasets is in different policy categories. Readers who are interested in the judgement of specific datasets are referred to appendix 2.

4.1.4.1. Amount of information

When taking a look at the data that is provided by the UK; it becomes clear that the MoD data encompasses a variety of themes. In ministry-wide policy categories, it is clear that the provided information is mostly substantial or high in amount of information. The budget information is provided on annual basis and this leads to a substantial amount of datasets. Spending and procurement data is also provided on annual or monthly basis and details about the expenditures of individual civil servants, and the MoD expenditures over £25,000. The amount of datasets is high in especially the categories budget, spending and procurement. It is also observed that the MoD UK does not publish ministry-wide geographic information, while transparent legislation is provided on legislation.gov.uk (2020).

Most interesting are the high scores regarding the amount of information in MoD-specific categories, such as personnel information, health & medical information and datasets about veterans. The list of data that is provided in these categories is largely determined by the consultations that take place each two years (R1, R2). During these meetings, it is checked whether the published data is still relevant for external stakeholders and whether there are additional requests for proactive transparency of government data. The MoD also provides some information regarding the activities and equipment of the armed forces. All in all, this results into a relatively high score on amount of information regarding MoD-specific categories.

4.1.4.2. Openness of data

In the UK, it can be observed that annual data till 2017 is predominantly published in only excel and/or pdf-file (category low or high public data). This has changed in the last three years, whereby open document formats, such as ODS or CSV, are presented next to Microsoft Excel and PDF files. This is the case for datasets in almost every policy category: budget, spending, procurement, personnel information, Veterans, health & medical information, and the activities and equipment of the Armed forces. As such, the MoD Department of Statistics chooses to present data in line with open document formats conditions. The results table shows that the majority of open data is publicized in open document format. A full assessment of the total strength of open data in the UK MoD can be found in table 9.

Table 9. Open data assessment UK

MoD-specific policy categories	Amount of information	Openness of information	Score
Budget	Substantial	Open data	**+**
Spending	Many	Open data	**++**
Procurement	Substantial	Open data	**++**
Geographic information	n/a	n/a	**n/a**
Legislation	Many	Public data (low)	**++**
Average			*+(+)*
MoD category	**Amount of information**	**Openness of information**	**Score**
Organisational information	Substantial	Open data	**+**
Health & medical information	Substantial	Open data	**+**
Veterans	Substantial	Open data	**+**
Activities of the Armed forces	Some	Open data	**+-**
Equipment of the Armed forces	Some	Open data	**+-**
Average			*+*

4.2. The Netherlands

4.2.1. Policy and strategy

The Netherlands joined the OGP in 2012 and since that moment a continuous effort is made by the Ministry of the Interior and Kingdom Relations (MIKR) to coordinate and stimulate transparency and open data policies among local and national governments (R5). The emphasis is on possibilities of proactive transparency and open data, which also includes involving civil society partners who are interested in using open data. These efforts have also resulted in various policy documents, including Open Government Action plans (2013; 2016-2018; 2018-2020) and the Data Agenda Government (Rijksoverheid, 2019; 2020a). In all these policy documents, the emphasis is on certain public organizations that are frontrunners in dealing with transparency or open data. These examples are presented so that they can inspire other public organizations to follow a similar path. It is found that the MoD is never mentioned in one of the action points in the aforementioned national policy documents. The interviews also confirm that the MoD is currently not partaking in national transparency or open data policy initiatives (R5, R6).

The MoD does also not publish any transparency strategy or guidelines on their own initiative. There are, however, relevant policy documents about cyber security and strategic innovation (Ministerie van Defensie, 2016; 2018a). These documents emphasize the importance of advancing digital and technological innovations, without having any attention for the potential benefits of open data in MoDs (see also table 1). It is expected that the MoD will publish its first Data Strategy in 2020

or 2021. This strategy will be focussed on increasing data skills and providing instructions on how data can be used as an important tool (R6). This shows that the MoD is interested in developments regarding data, but not with regards to open data specifically. The interviews also acknowledge that there is no such thing as an overarching transparency or open data strategy from the MoD; let alone specific guidelines or instructions (R6, R7, R8).

In contrast to these findings it can be observed that all employees within the MoD are seemingly open to sharing certain information from a policy viewpoint (R6, R7, R8). As one the respondents stated:

> *"The MoD also has an interest in being in the middle of society as much as possible. This to provide an image that is attractive to the public and potential employees" (R8).*

This suggests that the MoD does consider it important to be transparent on certain themes, especially if it can improve its image. This importance of visibility is also named in the Defense White Paper (2018b) which states that the MoD will again be investing in "people, strength and visibility". However, no concrete action plans regarding transparency can be found in the same document. Again, this shows that the importance of transparency is sometimes underlined, but not worked out in exact policies or protocols.

To conclude, this paper has drawn out three different criteria to determine the strength of policy and strategy. The first two criteria refer to either strategies or protocols by which proactive transparency is provided. This paper observes that this type of information is not found, or insufficiently described, in all potentially relevant strategy, policy documents or guidelines. Therefore, this paper argues that the Dutch MoD scores weak on the first two indicators. The third indicator aims to measure how the MoD responds to national transparency initiatives. The interviews suggests that the MoD has taken an outsider position in national open government plans (R5, R6). This corroborated by the fact that the MoD is not once involved in action plans as commissioned by the MIKR. This also leads to a weak score on the third indicator. In sum, the analysis shows that the Dutch MoD scores weak on all three indication of the institutional factor policy and strategy.

4.2.2. Legislative foundations

In the Netherlands, various laws play an important role in establishing transparency and open data. A foundation for transparency is stated in the Dutch Public Accesss Act (Wet openbaarheid bestuur), which was implemented in 1978 and updated in 1991 (Wob, 1991). The Wob is predominantly known for its opportunity to request information via information requests; a form of passive transparency. Lesser known is the fact that the Wob is also a driver for proactive disclosure of information. Local and national governments are required to proactively provide information about policy preparation and execution. This information should be provided in easy compressible form, so that citizens easily find or understand the government's plans.

In 2015, another foundational legislative block for proactive transparency got implemented, which is the Reuse of Government Information Act (Who, 2015). This law further broadens the scope

of the Wob and specifically encourages governments to publish information in a machine-readable format as much as possible. However, the prime focus is on passive transparency, meaning that it is important that potentially 'reusable' information is first requested by external parties. Moreover, there are a variety of conditions under which a request for releasing information can be declined, for example due to security considerations. The upcoming Act on Open Government will further establish opportunities for governmental agencies to be proactively transparent (Rijksoverheid, 2020b). In addition, the Reuse of Government Information Act will be updated in 2021, following the Open Data and PSI Directive from the EU (Rijksoverheid, 2020c). However, these laws are not considered in this paper as these are not fully implemented.

In contrast, there is also legislation that aims to protect information that is held by the government. The interviewees suggest that the following laws are most important to consider in the context of the MoD (R6, R7, R8):

- Wet bescherming staatsgeheimen 1951 (Law protection state secrets)
- Wet op inlichtingen en veiligheidsdiensten 2017 (Law on intelligence and security services)
- Uitvoeringswet Algemene verordening gegevensbescherming 2018 (AVG) (GDPR)

All these laws, are important for making possible that the government can protect information that might put the government, or its citizens, at danger. The Law protection state secrets and the Law intelligence and security services, both provide the opportunity to classify documents according to certain level of secrecy (R8). The GDPR emphasizes that data held about individual persons cannot became public (AVG, 2018). Based upon this legislation, information within the MoD is classified according to different security levels (R7, R8).

In conclusion, this paper aims to grade the Dutch legislation regarding transparency and open data. This paper has shown that the Wob requires ministries to proactively publish information about policy, preparation and execution. However, this legislation does not specifically consider if there is (any) open data information that should be made public. Therefore, the strength of legislation about government information is graded as weak. In addition, this paper looks if there is legislation that specifically stimulates or requires governments to publish data in an open format. The Law Reuse of Information states that information should be, as much as possible, provided in a 'machine-readable format', but leaves open the possibility to not follow this direction. As such, this paper grades the legislation regarding 'open data formats' as moderate.

4.2.3. Organizational Arrangements

This paper also takes a look at the organizational arrangements under which transparency and open data can be enabled. In the Dutch context it can be observed that the MIKR is given the authority to stimulate open data practices at other ministries and local governments (R5). It does so by publishing shared policy initiatives (BZK, 2013; 2016; 2018), but also by bringing together different ministries in an 'open data' working group. Interestingly enough the MoD, became late involved in this working group. As one of the MoD policy makers put it:

"That agenda was for 80% finished, and you do not want to become a jammer in such a process. These people had already put in a lot of effort and the deadline was close. At that point, we said we don't want to disturb this process, despite our lack of agreement with it". (R6).

This comment suggests that the MoD, to a limited extent, participates in national open data initiatives by discussing the underlying goals of national open data strategies.

Furthermore, it can be observed that across different ministries a great divergence exists in the way open data tasks are delegated in the organization (R5). Ministries choose to give this responsibility to information officers, data officers or privacy officers, which can lead to confusion about how data is managed in each organization. In the context of the MoD, it can be observed that the management staff is undergoing a reorganization (R6, R7, R8). The MoD has recently appointed two chief data officers who have been given the responsibility to provide a strategy about data-management and developing data-skills into the department. In addition, the portfolio regarding open data is now also transferred to the CDO, who will be responsible for policies and guidance regarding open data processes in the MoD.

To grade the organizational arrangements within the MoD, this paper takes a look at a) the influence of an (overarching) government organization and b) at the way the 'open data' tasks are delegated in the organization. From the analysis, it becomes clear the MIKR has a role of encourager to improve open data initiatives. However, it does never oblige ministries to publish certain information. The MoD has recently taken part in the national 'working group' regarding open data and this leads to a 'moderate' score on the first indicator of organizational arrangements. Moreover, it has taken the MoD some time and consideration to position the open data 'portfolio' within the organization. As of now, the open data 'portfolio' is situated at the CDO. Open data tasks only form a small fraction of the entire task list of the CDO, which is why this paper grades the second criterion of organizational arrangements as moderate. A total overview of all Dutch scores on the institutional factors can be found in table 10.

Table 10. Assessment institutional factors the Netherlands

Institutional factor	Criteria	Score
Policy and strategy	Strategy	Weak
	Guidelines and plans	Weak
	Participation in national policy initiatives	Weak
	Average	***Weak***
Legislative foundations	Open information	Weak
	Open formats	Moderate
	Average	***Weak/moderate***
Organizational arrangements	Supervising authority	Moderate
	Delegation of open data as task	Moderate
	Average	***Moderate***

4.2.4. Open data assessment the Netherlands

Now that the strength of each institutional factor is assessed, it is time to look at the empirical results for the dependent variable. In the Netherlands, it can be found that 'open data' is provided via a variety of platforms, which include: opendata.rijksbegroting.nl, cbs.nl, puc.overheid.nl, veteraneninstuut.nl, and the main platform data.overheid.nl. Below I will discuss the different types of information that are available in the Netherlands and show their score based upon the instructed criteria. Readers who are interested in the judgement of specific datasets are referred to appendix 2.

4.2.4.1. Amount of information

The amount of information that is provided varies per theme. For the ministry-wide policy categories, it can be observed that especially the budget and legislative data score high in amount of information, having obtained the score 'substantial'. The spending data that is provided by the Dutch MoD only shows how many times certain companies have made a deal with the MoD, instead of considering the exact amount of each contract. Given the fact that the US and the UK do provide such data, this leads this study to assess procurement and spending data as 'some'. Similar to the UK, the Netherlands does not provide ministry-wide geography data and provides full information on legislation. In MoD-specific policy categories, a score of 'some' information is found for every category. This means that in these categories, somewhere between the equivalent of 1 to 5 datasets are available. One positive highlight provides the very recent publication of week overviews of airstrike operations during the anti-ISIS coalition. These data have become public under much political and societal pressure from civil society organizations (R4), and are now available via data.overheid.nl.

4.2.4.2. Openness of data

The openness of data in ministry-wide policy categories shows good performance. Budget information is provided in CSV-files, which makes it open data. The spending and procurement information is provided on the national platform data.overheid.nl, provides data in CSV-files from various sub-departments. Legislative information is provided in non-downloadable form, and can be accessed via wetten.overheid.nl. Datasets in MoD-specific policy categories show relatively poor performances on openness. All policy categories except for activities of the Armed forces, show that low public data is produced. Most of the information is generated from policy documents or infographics from websites. As such, the data is mostly shared via pdf-files, which leads to an openness score of mostly 45% for individual datasets. Rare exception provides the data about week overviews of airstrike operations during the anti-ISIS coalition. This data has become public under much political and societal pressure from civil society organizations (R4), and is now presented in CSV-files via open.data.overheid.nl. All in all, it shown that the Dutch MoD provides more openness of data in ministry-wide than in MoD-specific policy categories.

Table 11. Open data assessment the Netherlands

Ministry-wide policy categories	**Amount of information**	**Openness of information**	**Score**
Budget	Substantial	Open data	**+-**
Spending*	Some	Open data	**+-**
Procurement*	Some	Open data	**+-**
Geographic information	n/a	n/a	**-**
Legislation	Many	Public data (low)	**++**
Average			**+(-)**
MoD-specifc policy categories	**Amount of information**	**Openness of information**	**Score**
Personnel information	Some	Public data (low)	**-**
Health & medical information	None	Public data (low)	**--**
Veterans	Some	Public data (low)	**-**
Activities of the Armed forces	Some	Open data	**+-**
Equipment of the Armed forces	Some	Public data (low)	**-**
Average			**-**
*Spending data is only provided in terms of amount of transactions per year; not the amount of the transactions is included. This is why the openness of information is graded as some.			

4.3. United States

4.3.1. Policy and Strategy

In the US, it is important to understand the policy initiatives that have been proposed under the Obama and Trump administration. The Obama administration started off with a strong national push towards more transparency. President Obama signed the Memorandum on Transparency and Open Government and instructed the Office of Management and Budget (OMB) to stimulate transparency and open data initiatives across federal agencies (Obama, 2009). This was further articulated in the Open Government Directive, which detailed how federal agencies should take concrete steps to improve their transparency efforts (Orszag, 2009). It included information about how to publish information online, how to improve the quality of information, create a more open government culture and how to improve open government policies and plans. In 2013, Obama further pushed federal agencies to improve their open data policies with Memorandum 13-13, which detailed further of federal agencies should publish open data in an open and machine-readable format (Obama, 2013). Alongside these concrete steps, the US became also strongly involved in the start-up of the OGP which started on September 20, 2011 (OGP, 2020). Under the Obama Administration, the US participated in the OGP by publishing three national action plans in 2011, 2013 and 2015 with more concrete steps to improve transparency efforts (Obamawhitehouse, 2011; 2013; 2015).

For the DoD, the Open Government Directive had a direct influence on policies and strategies, because each federal agency was now required to publish their own open government plan. For the DoD, this resulted in four different open government plans (DoD, 2010a; 2012; 2014a; 2016). These

plans detailed concrete actions around themes such as open data policies, improvement of the FOI, increasing the efficiency of declassification systems and creating an open data structure. The DoD also launched two transparency and open data websites: open.defense.gov and data.defense.gov, which also provides policy documents regarding for example 'how to access financial data'. However, it is important to consider that both websites have not released new policy plans since 2017 and that many information links are broken. There is also no opportunity to get into contact with people from the DoD, further suggesting that the websites and accompanying policies are no longer active.

Under the Trump administration, national transparency policy plans have seen a clear change in emphasis. A delayed National Action Plan was published as part of the US participation in the OGP in 2019 and was critically received for only describing already established efforts (Bublé, 2020; R12). In contrast to the previous National Action Plans, the DoD is also not mentioned as an actor participating (Open.usa.gov, 2019). Moreover, the DoD no longer follows the Open Government Directive (Orszag, 2009) and has stopped publishing open government plans. Again, this shows that under the Trump Administration, open government policies and strategies in the DoD seem no longer active. This also confirms with findings that the DoD is becoming more secretive (Bublé, 2020). In addition, a policy advocate close to the DoD argues that the DoD can withdraw from transparency policies if they feel the need:

> *"But the general signs for the Department of Defense, is that if you want to withhold information the White House will back you up. So that's giving more free range for the people who do want to be more secretive". (R11).*

However, Trump has not fully regressed all open data efforts. In presidents Trumps Management Agenda a new 'Cross-Agency-Priority' (CAP) was set to leverage Data as a Strategic Asset (Trump, 2018). This has resulted into a Federal Data Strategy and Action Plan (OMB, 2020). In this action plan, six actions have been set out for all federal agencies, including action point 5: **"**Identify Priority Data Assets for Agency Open Data Plans". This action requires the DoD to research if relevant datasets can be used for open data initiatives.

In conclusion, the strength of policy and strategies in the DoD have clearly seen a rise and decline in the last decade. It can be observed that up until 2017 the DoD published open government plans both detailing strategies and policy guidelines. This would have resulted in a 'high' scores for criteria 1 and 2. However, the current assessment in 2020 shows something different. Open government strategies or policy guidelines are no longer published by the DoD, which is why the first two criteria score as 'weak'. Moreover, this paper considers the extent to which the DoD is involved in national policy initiatives. Before 2017, the DoD followed the Open Government Directive from the OMB and played a large role in national action plans for open government (Obamawhitehouse, 2011; 2013; 2015). In contrast, the latest National Action Plan for open government does not share how or if the DoD participates. It still remains to be seen how the DoD complies with Action Point 5 from the Federal Data Strategy. The findings from reports and respondents suggest that the DoD is currently withdraws from participation in national transparency policies (Bublé, 2020; R11). Taken together, this paper concludes that the US also scores on weak on the third criterion of policy and strategy.

4.3.2. Legislative foundations

In the US, a wide variety of laws play a pivotal role in determining open data publication. The most important ones are the Digital Accountability and Transparency (DATA) Act (2014) and the Open Data Act (2019). The DATA Act mandates the publication of award and grant data and stimulates the coordination between industry and federal agencies to make open data useful. More ambition can be found in the Open Government Data Act (2019). This law regulates that all non-sensitive government data is openly published in a machine-readable format with an open license. It also puts many of the policies articulated in the Memorandum 13-13, "Open Data Policy-Managing Information as an Asset" (M-13-13) into a legislative requirement. It provides legal definitions of "open license", "public data asset" and "machine-readable". In this way, it creates an equal playing field for all federal agencies. The Open Government Data Act (2019) also makes the website Data.gov a requirement in statute, rather than a policy. Furthermore, it stimulates communication about best practices and requires federal agencies to appoint a CDO (Chief Data Officer). All these requirements, stimulate the usage of open data as an important tool.

As the Open Data Act requires federal agencies to publish information that is non-sensitive, it becomes important to understand on what grounds a federal agencies can hinder open. Sensitive information relates to data that can lead to privacy, confidentiality or security concerns for society. In contrast to the Netherlands and the UK, the US does not have a general secrecy law that protects information for security concerns. Instead, there a couple of laws that enable for the protection of information, such as the Espionage Statutes Modernization Act (2010) and the Intelligence Identities Protection Act 1982 (Elsea, 2013). These laws primarily enable for the punishment of people who purposively try to disclose sensitive information. Moreover, it is interesting that the security classification of information is primarily regulated on the basis of presidential mandates, instead of legislation (Quist, 1993). There are various mandates, from Eisenhouwer to Obama, that have led to the current classification system. The current security classification system can classify data as top secret, secret and confidential. Information can also be classified as sensitive based upon privacy laws. However, the privacy legislation is not formed in a general law (like the regulations in GDPR), but is laid out in a great variety of laws that can be applied to the DoD (Elsea, 2013).

Again, this research shows how different legislation can influence open data provision. In the US, it can be observed that there are strong foundations for open data publication. The most recent implementation of the Open Data Act 2019, requires federal agencies to publish all non-sensitive information. This shows that the US performs strongly on the first legislative criteria, which requires federal agencies to publish certain information. Moreover, the Open Data Act 2019 also requires for the publication of information in a machine readable and open format. This also results in a strong performance score on the second criterion of legislative foundations.

4.3.3. Organizational arrangements

To describe how the DoD is influenced by organizational arrangements, it is first important to consider the size of the DoD in comparison to other MoDs. The DoD is the biggest department in the United States and also by far and large of the biggest MoD in the entire world (Performance.gov., 2020; Tian, Fleurant, Kuimova, Wezeman & Wezeman, 2019). The US spending on defense is 10 times higher than

the 10 following countries combined. The DoD also takes up tasks that are not commonly executed by MoDs, such as providing information about weather conditions or River Traffic Data. This shows that position of the DoD, in terms of its national importance, is different from MoDs in other countries.

Still, the DoD is influenced by 'higher' authorities, like the Office of Management and Budget (OMB) in the Executive Office of the President. In the past, the OMB laid out how federal agencies should meet the ambitions in Obama's Transparency Memorandum (2009). Right now, the OMB has produced a national data strategy (2020), which requires all federal agencies to make an inventory of datasets that are relevant for open publication. The national plans from the OMB are presented as 'requirements' for the federal agencies. However, it has been shown multiple times that the DoD, and other federal agencies, can withhold from completing the required tasks (Bublé, 20202; R11). This shows that the OMB is more an encourager instead of enforcer when it comes to transparency policies. All in all, this leads to a 'moderate' for the institutional criteria 'supervising authority'.

The second criterion is interested in how 'open data as task', is embedded in the organization. Each federal agency is now required to appoint a Chief Data Officer (CDO), which is also the case for the DoD (Open Government Data Act, 2019). The CDOs are primarily concerned with efficacy and efficiency of data management, but should also encourage engagement with the public by sharing open data. The DoDs CDO is recently appointed on the 19th of June and emphasizes how data can be used to create a competitive advantage (Vergun, 2020). It is unclear if the CDO will also partake in establishing open data efforts. Based upon the instructions for each general CDO, this paper expects that at least a part of the CDO's (or one of his colleagues) should be devoted to establishing open data. However, this suggestion is not confirmed by the interviewees or the extensive secondary literature analysis. Reports and respondents suggest that the DoD has proliferated more secrecy since they have been given the opportunity (Bublé, 2020;R11, R12). Based upon these mixed results, this paper grades the DoDs score on 'delegation of open data as a task'' as weak/moderate, while taking uncertainty in mind. Therefore, the score regarding the second criterion is made cursive.

Table 12. Assessment institutional factors US

Institutional factor	**Criteria**	**Score**
Policy and strategy	Strategy	Weak
	Guidelines and plans	Weak
	Participation in national policy initiatives	Moderate
	Average	***Weak/moderate***
Legislative foundations	Open information	Strong
	Open formats	Strong
	Average	**Strong**
Organizational arrangements	Supervising authority	Moderate
	Delegation of open data as task	*Weak/moderate*
	Average	***Moderate***

4.3.4. Open data assessment United States

To assess the strength of open data in the DoD, datasets across various platforms have been researched. The open data from the DoD is mainly provided via data.gov. This platform primarily provides information about MoD-specific policy categories. Next to the data.gov platform, there are various platforms that share information about ministry-wide policy categories: beta.sam.gov, usaspending.gov, fdps.gov, comptroller.defense.gov and congress.gov. This shows that there is more diversity in channels through which open data is provided than in the UK and the Netherlands. Readers who are interested in obtaining more information about one open data portal, are referred to appendix 2.

4.3.4.1. Amount of information

The DoD shows a strong performance in amount of information that is provided in ministry-wide policy categories. Budget information is provided via Comptroller.defense.gov. and provides up-to-date annual information about budgets in nine subcategories, ranging from personnel programs to procurement budgets. As such, the amount of information regarding budgets can be considered high. Spending data is provided via the usaspending.gov platform. This website contains detailed information about over 24 million DoD contracts funding and awarding companies, including the exact dollar amounts. In addition, procurement data is provided via the platform beta.sam.gov., which is a new platform that is still in the development stage. The data that is already provided via beta.sam.gov can be considered a large amount. Information about contract opportunities is provided for contracts that exceed 25.000 (see appendix 2). It further shows 50 million results regarding contract data over around 60.000 contract opportunities in the near future. The goal of this data is to provide people the opportunity to actively search chances for doing business. In addition, the DoD also provides many geographical datasets that can be used by the public. The Army Corps of Engineers provides currently 277 datasets on data.gov., of which many are regularly updated regarding topics like land maps, boarders, shore lines, lakes and dredging. In contrast to the other MoDs in this research, the US scores therefore high on the category of geographic information. Lastly, information about legislative processes and legislation can be found via Congress.gov., providing a complete image of legislation that is applicable to the US.

In the US, much less information is provided in MoD-specific policy categories. With regards to personnel information, there can be found reports about the amount of personnel and the differences between different ethnic groups and gender. However, not all information about social backgrounds is up-to-date, giving it the classification of ‘some’. This research almost found no data about health & medical information. The authority on the military and health does not provide open data and also data.gov provides no up-to-date health & medical information (Health.Mil, 2020). Rare exception is the Defense and Veterans Brain Injury Centre, which comes with annual data about Traumatic Brain Injuries. Thus, the amount of health and medical information is scored as ‘some’. The DoD does not produce data about the equipment of the armed forces. This data was first published in the Quadrennial Defense Review of 2010 and 2014, but is not provided in the succeeding National Defense Strategy 2018 (DoD, 2010b; 2014b; 2018). More data is provided about the activities of the Armed forces. In this category, information In this category, data is provided about casualties, deaths and

other actions, leading to a 'substantial' score in amounts of information. In addition, there is a quite extensive amount of information provided about Veterans. This information is provided by the Veterans Affairs Department, an independent department outside the DoD. There is a special open data portal for Veterans which includes a high amount of datasets, ranging from topics like gravesite locations to educational assistance spending. As such, the veterans data scores 'high' on amount of information.

4.3.4.2. Openness of data

The assessment of openness shows mixed results for the DoD. The budget information is provided in an excl. format, leading to a high public data score in this category. All spending and procurement data is provided in CSV-files that can be freely used by others, which gives it the categorization of 'open data'. The geographical data is presented in different formats, ranging from merely html links, GeoJOSN to CSV files when applicable. The Army Corps of Engineers also provides information in open 'API's' (Application Programming Interface), which can be used by citizens for various applications. Overall, the geographic information is mainly provided in an open-format, leading to an 'open data' score. In contrast, legislative information is provided in a non-downloadable format, making it 'low public data'. All in all, the results of openness are relatively strong for ministry-wide policy categories.

The MoD-specific policy categories show relatively weak scores on openness. Personnel information about social backgrounds is only provided in pdf-formats and this is also the case for the traumatic brain injuries reports (health & medical information). Therefore, both categories score as public data (low). Some information about the activities of the Armed forces, such as casualty data, is provided in excl. format, making it a form of high public data. The veteran data scores as 'open data' as most datasets are provided in open formats, such as CSV and JSON. Furthermore, no open information is provided about Equipment of the Armed forces. All in all, this shows that in MoD-specific policy categories, the MoD is less willing or capable of publishing data in open-format.

Table 13. Open data assessment US

Ministry-wide policy category	**Amount of information**	**Openness of information**	**Score**
Budget	High	Public data (high)	**++**
Spending*	High	Open data	**++**
Procurement*	High	Open data	**++**
Geographic information	High	Open data	**++**
Legislation	High	Public data (low)	**++**
Average			**++**
MoD-specific policy category			
Personnel information	Some	Public data (low)	**-**
Health & medical information	Some	Public data (low)	**-**
Veterans*	High	Open data	**++**
Activities of the Armed forces	Some	Public data (high)	**-**
Equipment of the Armed forces	None	Not applicable	**--**

Average			-
*data is not owned by the DoD, but by the Veteran Affairs Department			

4.4. The relationship between institutional factors and open data in MoDs: a comparison

4.4.1. Comparison of institutional factors

The analysis of the institutional factors shows a diverse image. The UK is the strongest in policy and strategy, especially because it provides the strongest guidelines and participates in policy initiatives from the GSS. Legislative foundations for open data are the strongest in the US. In this country, all 'non-sensitive information' is required to be published in open formats as can be concluded from the Open Data Act (2019). The Netherlands and the UK primarily rely on legislation that encourages proactive transparency without considering the specific opportunities for types of open data in mind (FOI, 2000; Wob, 1991). Moreover, both countries are only encouraged, not required, to publish more information in open-format (Re-use of Public Sector Information Regulations, 2015; Who, 2015). Lastly, it can be concluded that the UK is stronger on organizational arrangements, both in terms of supervising authority and the delegation of 'open data' as a task. The Netherlands and the US only have an 'encourager' as supervising authority and they also devote less organizational resources to perform open data as a task.

Table 14. Comparison of institutional factors

Institutional factor	Criteria	UK	Netherlands	USA
Policy and strategy	Strategy	Weak	Weak	Weak
	Guidelines and plans	Strong	Weak	Weak
	Participation in national policy initiatives	Moderate	Weak	Moderate
	Average	Moderate	Weak	Weak/moderate
Legislative foundations	Types of information	Weak	Weak	Strong
	Open formats	Moderate	Moderate	Strong
	Average	Weak/moderate	Weak/moderate	Strong
Organizational arrangements	Supervising authority	Strong	Moderate	Moderate
	Delegation of open data as task	Strong	Moderate	*Weak/moderate*
	Average	Strong	Moderate	*Weak/moderate*

4.4.2. Comparison of open data in MoDs

The results show that different countries are strong in open data in different policy categories. In ministry-wide policy categories, the USA and the UK are especially strong, They both provide open data about especially budgets, spending and procurement. The US is unique in its publishing of strong non-military geography information. The Netherlands lacks behind in terms of spending and procurement data, because it only details the transactions made and not the exact amounts of contracts. Overall, all countries show that they score relatively strong in ministry-wide policy categories.

In MoD-specific policy categories, it can be viewed that the UK scores the highest. For example, it publishes personnel reports and a variety of medical information in open format. The Netherlands and the US score both low on MoD-specific categories for different reasons. The Netherlands does publish information about their personnel, health, veterans and the equipment of the armed forces, but only in non-open pdf-formats. This results in low scores on the 'openness' dimension of the open data-assessment. The US is very strong in open data information from Veterans, but this information is provided by an organization outside the DoD: the Veteran Affairs Department. Moreover, US personnel reports are only provided in pdf format and health information is not as complete as in the UK. More importantly, there is no data about the equipment of the Armed forces. All results together provide nuanced findings, but does show that UK provides the strongest open data when all policy categories are considered. Table 15 summarizes the scores of each country on the open data-assessment.

Table 15. Comparison of open data in MoDs

Ministry-wide policy categories	**UK**	**Netherlands**	**USA**
Budget	**+**	**+-**	**++**
Spending	**++**	**+-**	**++**
Procurement	**++**	**+-**	**++**
Geographic information	**n/a**	**n/a**	**++**
Legislation	**++**	**++**	**++**
Average	**+(+)**	**+(-)**	**++**
MoD-specific policy categories			
Personnel information	**+**	**-**	**-**
Health & medical information	**+**	**--**	**-**
Veterans	**+**	**-**	**++**
Activities of the Armed forces	**+-**	**+-**	**-**
Equipment of the Armed Forces	**+-**	**-**	**--**
Average	**+**	**-**	**-**

4.4.3. Understanding the relation between institutional factors and open data in MoDs

This paper has shown that the strength of open data in MoDs is different for data in two categories: ministry-wide policy categories and MoD-specific policy categories. One explanation for this difference lies in the *'sensitivity'* of the data. MoD-specific data implies direct information about military personnel, their activities or their equipment. This information is more sensitive as it can provide valuable information for (non-)military opponents. Safeguarding the interests of military personnel and veterans is considered crucial by various MoD employees (R1, R2, R6, R7, R8), which can partly explain why MoDs are more hesitant to share MoD-specific data.

In especially MoD-specific policy categories one important phenomena should be taken into account. It is the idea that even when a large amount individual datasets is non-sensitive, the combination of data-sets can still lead to privacy or security risks. In US policy documents, this is referred to as the 'mosaic effect' (Burwell, VanRoekel, Park & Mancini, 2013):

> *"The mosaic effect occurs when the information in an individual dataset, in isolation, may not pose a risk of identifying an individual (or threatening some other important interest such as security), but when combined with other available information, could pose such risk."*

In the US, agencies are asked to take the mosaic effect into account before publishing information. Respondent working at MoDs in the UK and the Netherlands argue that this phenomena is especially relevant for defense-related information (R1, R2, R6, R7, R8). One of the interviewees also inadvertently used the metaphor of 'puzzling' to describe this phenomena:

> *"If safety then (next to privacy) also plays an important role, it will be even more difficult. What you see is that it is also becoming easier to discover connections in large datasets. So it is much easier to stick pieces of puzzle pieces together. Which makes you end up with a person who you still want to protect ... that means that you have to weigh those interests very carefully. It is beyond dispute that you cannot always tell everything." (R7, own translation, the Netherlands)*

The quote shows that MoDs deal with more sensitive data for privacy, confidentiality and security risks. This acknowledgment also affects the relationship between institutional factors and open data in MoDs. The following two sections show how this is the case.

4.4.3.1. The process towards open data in MoD-specific policy categories: the importance of guidelines and organizational arrangements

To further understand the process towards strong open data in MoDs, this study takes primarily inspiration from how open data is established in the UK. The MoD employees in the UK acknowledge that open data provision is a balancing act. Due to the sensitivity of specifically MoD-specific data,

MoDs need to be extra careful before publishing certain information. This is also illustrated by the underlying quote:

> *"But we're constantly walking that fine line between how do we build public trust in statistics, against actually balancing that against the security demands of not seeing military personnel at risk, which is the real concern … like I say, we've got the strictest rules what the department is prepared to release." (R1).*

The quote shows that safeguarding the interests of military personnel leads to stronger restrictive regulations on releasing information. This makes providing open data a more complicated and time-intensive issue, Before information can get out, security and privacy reviews have to be performed (R1, R2, R6, R7, R8). The effect of transparency and open data legislation is less impactful, because it can always be combatted with exception provisions from secrecy regulation. To balance the fine line between the need for secrecy and building trust with democracy, more organizational resources are needed to provide open data. The benefits from better organizational arrangements and specific policy guidelines are especially shown in the UK, where statisticians see it as their responsibility to share and discuss what open data can be provided (R1, R2). More importantly, it is essential to have an overarching authority that demands open data provision. This is, again, most eloquently put in the following quote:

> *"And so as a department we would do the minimum that the GSS tell us we have to do. We do the minimum we can get away with, because we are a small team. The MoD is 350000 personnel, military and civilians. And we have a huge amount of work inside the department and that's where the department wants its analysts looking. So they (the MoD) get irritated if we say that we're not going to do some policy evaluation because we've got to release some open data. That does not go down well in the MoD. We don't have enough analysts." (R1)*

The quote shows a) that the pressure of a national authority is needed to publish open data (in this case the GSS) and b) that it is crucial to have employees who are willing to provide open data instead of performing an internal policy evaluation. These conditions lay the basis for a variety of open datasets that are provided in MoD-specific policy-categories (R1, R2). In the Netherlands and the US organizational arrangements are less strongly organized, which potentially explains why their open data provision is less strong in MoD-specific policy categories.

In addition, this research finds that strong policy guidelines play an important role in establishing open data. In the UK, there are various guidelines detailing how data should be published in open format. Moreover, the policy guidelines clearly articulate that data should be published in collaboration with users. The interviewees corroborate that these guidelines are of great importance for successful open data publication (R1,R2). A similar finding is obtained in the Netherlands. The Dutch MoD got pressured to collaborate with civil society organizations and this led to some agreements about transparency on civilian harm (R4). Following the requests of the civil society organizations, the

MoD responded by publishing the requested information about the fighter aircraft F16 in open data format.

4.4.3.2. The process towards open data in ministry-wide policy categories: the importance legislation and presidential mandates

The findings from this research suggest that data in ministry-wide policy categories are less susceptible to security and privacy concerns. Interestingly, it is also shown that strong legislation can be especially important in these policy categories. This can especially be viewed in the case of the US, where strong open data legislation has led to strong performances strong open data provision of budgets, spending, procurement and geographic information. An exemplary case to further understand the relationship between legislation and open data in MoDs, is provided in the policy category spending. It was even before the DATA Act, that legislation mandated the transparency of spending data. The Federal Funding Accountability and Transparency Act of 2006 (FFATA), mandated to establishment of the USASpending.gov. database which forms the basis of all provided spending data. The DATA Act required additional expenditures to be published and, in this way, conditions were set for strong open data performance in spending. The recent implementation of the Open Data Act (2019) builds upon these foundations and now requires all 'non-sensitive data' to be made public. It is likely that the US, therefore, will be publishing more open data in ministry-wide policy categories in the near future.

Usually MoDs have a hesitance stance towards transparency (R8, R11). Legislation that requires governmental agencies to publish all 'non-sensitive data' in open format can make a shift for the transparency position of MoDs. More than without this legislation, secrecy needs to be justified. The potential positive effect of legislation that is specific about types of data, can also be found in the success of presidential mandates. Policy initiatives that are articulated in presidential mandates are mostly followed by governmental organizations, even by the MoD. This can be observed Prime-minister David Cameron (2010) wrote a letter to central government agencies requiring them to provide transparency about every spending over £25,000. This requirement is still followed by the MoD and other governmental agencies. President's Obama Memorandum on Transparency and Open Government eventually stimulated the DoD to make their own open government plans that, back then, resulted in strong open data performances. In the Netherlands, there are no open data policies are directly commissioned by the prime-minister. At the same time, the Netherlands also scores the weakest on open data in ministry-wide policy categories, such as spending and procurement. This shows that legislation, and policies imposed by political leaders, can greatly improve the strength of open data in ministry-wide policy categories.

5. Discussion

This research has attempted to answer the following research question: ""How do institutional factors influence the proactive transparency of government data in Ministry of Defense's (MODs) in the UK, US, and the Netherlands?". The study looked into detail how different components of policy and strategy, legislation and organizational arrangements affect the open data in MoDs. The results show that the influence of institutional factors is different in MoD-specific policy categories and ministry-wide policy categories.

The open data that is provided in MoD-specific policy categories is greatly influenced by the strength of policy guidelines and organizational arrangements. The publication of MoD-specific data requires extensive reviews of security and privacy risks; a task that is time-intensive. It is, therefore, of crucial importance to have a strong (higher) authority that demands this data and that also provides sufficient organizational resources to delegate open data as a task. In addition, policy guidelines with an eye for collaboration with users and open formats tend to lead to stronger open data in MoD-specific policy categories. The open data that is provided in ministry-wide categories is more heavily influenced by legislation and policies following from presidential mandates. Ministry-wide data is generally less sensitive and specific, making it more receptive to strong legislation or policy requests from political leaders.

5.1. Theoretical implications

The findings from this research have theoretical implications for the open data literature. First, this research reaffirms the message that institutional factors can be of great influence in establishing open data (Safarov, 2019). The applied policies and strategies, legislation and organizational arrangements explain, to a large extent, how open data gets published in three different countries. Second, building upon Ruijer et al. (2019), this research shows that institutional factors can have different influences in different policy categories. MoD datasets in MoD-specific policy domains depend much greater on strong organizational arrangements and guidelines than in ministry-wide policy domains. Given that the majority of the literature is biased towards less sensitive policy domains, this research warrants the open government data literature that explanations for open data success can be different in more sensitive policy domains.

5.2. Avenues to advance the theoretical model

The theoretical model that is applied in this research provides a means to explain the variance in open data in MoDs across countries. However, several additional finding are found that do not (completely) fit the theoretical model. The first important additional finding is that social and political pressure can explain the establishment of open data in MoDs. This is illustrated in the UK and the Netherlands. The Afghan and Iraq war in which the UK participated till 2014, sparked much attention in the British media. This created a strong demand for all kinds of government data from the MoD. One respondent, explains, when first asked about the influence of national transparency policies, that the influence of public demand cannot be underestimated:

"It is hard to unpick that from the immense pressure we were under because of the operations in Iraq and Afghanistan and the massive demand that created for public interest in what was happening to the military. And that's probably when we were publishing the most, because we were publishing one statistic every fortnight and another one that went out every month. We were we were producing stuff just constantly" (R1).

It is especially, the combination of a) societal pressure and b) political pressure that can set the tone for open data in MoDs. This can also be observed in the Netherlands, where widespread attention for civilian harm in Hawidja led to the publication of data about operations of the fighter aircraft F16 in the war against ISIS (R4). Another illustrative example can be observed in the UK, where a parliamentary request led to the data publication of data about military amputees:

"The prime minister stood up in parliament when he was challenged about why the department couldn't count how many amputees it had and he literally went, I don't know the answer, but Defense Statistics will produce it in six weeks' time. And I literally got a phone call: hey you got 6 weeks. And I was like, I didn't even have the data, but all right!" (R1 UK).

A second avenue to advance the theoretical model is to include more attention for political leadership. This research has applied a relatively formal interpretation of organizational arrangements by only using supervising authority and delegation as a task as indicators. Also a much broader interpretation of organizational arrangement can be applied, in which the influence of political leadership is taken into account (Safarov, 2019). The literature also shows that political leadership can hinder and stimulate the successful adoption of open data (Barry & Bannister, 2014; Hossain & Chan, 2015), a finding that is also supported in this research. Especially in the US, it can be observed that with the entry of President Trump, the provision of open data has dropped by a mile. As one policy advocate close to the MoD explains:

"Certainly in the period where Obama was ordering these open government plans, there was real progress. And there were every year several more datasets being put online. And that was major progress. That has slowed down to not only a trickle, it also has partly reversed. The last couple of months the DOD has asked congress to no longer require publication of the unclassified version of the Defense Budget. There are some really retro grain moves." (R11).

"And that is what I meant, the signals from the White House has recently empowered these people within the agencies who want to be more secretive." (R11).

Both quotes show that the political leadership of president Obama and Trump has made a large impact in either creating or hindering open data in MoDs. A similar influence of political leadership can be found in the UK where a letter from prime-minister David Cameron in 2010 led to a requirement for central government organizations to share spending over £25,000. This regulation is still in place today.

Future research should, therefore, also take into account the influence of political leadership to explain open data in the MoD.

A third avenue for future research into open data in MoDs relates to two institutional factors: skills and the presence of civil society. Both institutional factors are also used in Safarovs institutional framework of open data utilization on a national level. This research find similar indications hinting at the relevance of each institutional factor. One policy-maker within the Dutch MoD emphasizes that acquiring and keeping relevant data-skills in the MoD is one of the biggest challenges (R6). As a public organization, the MoD is not able to compete with companies who offer better salary and opportunities to data-skilled personnel. Moreover, collaboration with civil users of MoD data can be of great importance. In the UK, data-analysists from civil society are invited to discuss the provided open data each two years. This is of great help in showing the societal relevance of open data in MoDs (R1, R2). A similar finding is obtained in the Netherlands, where a working group stimulated the publication of open data about operations of the fighter aircraft F16 (R4).

5.3. Methodological limitations and future research

Various methodological limitations should be taken into account to interpret the findings from this study. The measurement of the institutional factors is informed by an extensive analysis of documents and interview records. However, not all indicators have been graded with the same conclusive evidence. In the Netherlands and UK, evidence originating from the document analysis was validated by interview reports with especially policy-makers and analysts from the MoD. In the US, no employees from the DoD participated in an interview to discuss the influence of each institutional factor on open data. This makes it especially difficult to assess the strength of their organizational arrangements. From the document analysis and interviews with experts outside the DoD, there has been no indication that there is an officer who is fully committed to open data. Still, no certainty can be obtained from this finding, due to a lack of insight in the internal organizational dynamics within the DoD. As a result, the assessment of 'delegation as a task' warrants careful consideration in the US.

With regards to the measurement of open data in MoDs, especially two methodological limitations should be taken into account. First, the amount of information that is measured per policy category is absolute and not relative. It is not within the scope of this research to assess how much information is published in comparison to the information that is held within MoDs. The implication of the absolute approach is that this study cannot 'control' for the fact that some MoDs have more open data, simply because they held more information. It would require an in-depth investigation of internal information and data structures in MoDs to provide more insight in the relative amount of information that is provided by MoDs. Second, this study has measured the strength of open data in MoDs by looking at the amount and openness of the data. It was not considered to what extent third parties graded the data as useful. There is a growing body of literature that argues that more knowledge is needed about open data utilization and the perceptions of its users (Ruijer et al., 2017; Ruijer & Meijer, 2020; Safarov et al., 2017). An avenue of future research is to investigate how users of MoD data assess the provision of open data and for what purposes MoD open data is used. This can provide more insights into the potential societal benefits of open data from MoDs.

5.4. Practical implications

The practical relevance of this research follows from the influence of each institutional factor on the strength of open data in MoDs. It is shown that open data in MoD-specific policy categories raises more security and privacy concerns. This increases the sensitivity of the data, especially because the potential mosaic effect occurs. Therefore, individual datasets not only need to be screened for their own their own sensitivity level, but also for the sensitivity level in relation with other datasets. This phenomena requires that more organizational resources to review whether certain MoD information can be published as open data. If MoDs want to increase the strength of their open data, it is therefore necessary that 'open data as a task' is sufficiently embedded in the organization. This paper also highlights the importance of an higher authority that demands more open data to be published. The culture within MoDs is biased towards secrecy and, therefore, needs to be pushed by other organizations to publish more open data. This effect is especially visible in the UK, where the GSS is able to demand publications in some policy categories. In addition, policy guidelines play an important role in making sure that open data is published in an open, machine-readable format. This is also shown in the UK, where a variety of policy guidelines inform the work of MoD statisticians.

In addition, this research provides a wide-encompassing analysis of open data that is published across MoDs in three different countries. The unique data-assessment tool that is developed in this research can show practitioners what types of data can be published by MoDs. For example, the spending and contracting data in the US and UK details the exact amounts of money for which contracts are signed. In the Netherlands, this information is not provided. Moreover, the UK shares information about the health and medical treatments of military personnel. Sharing this data can be valuable for researchers and journalists, but also provide better insights for job seekers who want to entry the military.

6. Conclusion

This research has attempted to answer the following research question: ""How do institutional factors influence the proactive transparency of government data in Ministry of Defense's (MODs) in the UK, US, and the Netherlands?". This research looked into detail how different components of policy and strategy, legislation, and organizational arrangements affect the proactive transparency of government data in MoDs. A first conclusion is that the influence of institutional factors is different in MoD-specific and ministry-wide policy categories.

Data in MoD-specific policy categories can only be produced by the MoD and directly relates to information about the military, its activities, and their equipment. This data is shown to be more sensitive and, therefore, less open data is provided in MoD-specific policy categories. Only the UK performs strongly in MoD-specific policy categories. The MoD in the UK provides strong open data because they are a) pushed by a supervising authority, b) delegate open data as a task in their organization, and c) provide strong policy guidelines. These findings also suggest that other institutional factors are less important for establishing open data in MoD-specific policy categories. Strong transparency legislation is not sufficient for creating open data in sensitive policy domains, because security and privacy considerations play a more important role.

A different picture emerges when this research considers data in ministry-wide policy categories. Examples of data in policy-wide categories are budget, spending, and procurement data. This research shows that strong legislation is important in these policy categories. This is most clearly shown in the USA, where strong legislation sets the basis for a strong open data provision of primarily spending data. The FFATA (2006) and DATA Act (2014) mandated the establishment of USASpending.gov, and the Open Data Act (2019) requires agencies to publish all non-sensitive government data in a machine-readable and openly licensed format. The impact of this legislation is that the DoD participates in providing open data in ministry-wide policy categories.

The findings from this research can inspire future investigations of open data. The theoretical model and open data assessment tool developed in this research can also be applied to other security-related policy domains. In this way, more knowledge can be obtained about the influence of institutional factors on open data provision. An interesting avenue to advance the applied theoretical model is to research the influence of societal pressure and political leadership. Findings from the UK suggest that the establishment of open data was dependent upon the political interest of presidents and parliamentarians. This is also the case in the Netherlands, where widespread attention for civilian harm led to the publication of open data about operations in the war against ISIS.

This research also has practical implications. The data-assessment shows to practitioners what types of open data can be published by MoDs. This can be of inspirational value. The research shows, for example, that the UK provides strong open data about military personnel and medical information. In the Netherlands, such information is not provided in open-format. This shows that MoDs from different countries can learn from each other about how open data can be established. However, to systematically improve open data provision, MoDs will benefit most from being pushed by a demanding (higher) authority that instructs MoDs to create sector-specific policy guidelines.

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8. Appendices

8.1. Appendix 1: overview of secondary information sources per country

UK	
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8.2. Appendix 2: assessed data-sets

Datasets UK	Amount	Type of data	Link
Budget (+)			
Defence departmental resources: index	Substantial	Open data	https://www.gov.uk/government/statistics/defence-departmental-resources-2019
Overal assesment	**Substantial**	**Open data**	
Spending (++)			
MOD: workforce management information January to December 2020	Many	Open data	https://data.gov.uk/dataset/b53cd0d1-2042-442e-8565-c52604258772/mod-workforce-management-information-january-to-december-2020
MOD: spending over £25,000 and over £500 on a Government Procurement Card	Many	Open data	https://data.gov.uk/dataset/6e3301f7-f968-41fd-a37d-1c4999b0c034/mod-spending-over-25-000-and-over-500-on-a-government-procurement-card
MOD: senior officials' business expenses, hospitality and meetings, January to December 2019	1	Open data	https://data.gov.uk/dataset/9eacb996-db7a-4791-a14d-137e79de7e17/mod-senior-officials-business-expenses-hospitality-and-meetings-january-to-december-2019
MOD: special advisers' gifts, hospitality and meetings, January to December 2019	1	Open data	https://data.gov.uk/dataset/31221f75-fac3-40fb-b2ef-823e2bc7a131/mod-special-advisers-gifts-hospitality-and-meetings-january-to-december-2019
MOD: ministerial gifts, hospitality, travel and meetings, January to December 2019	1	Open data	https://data.gov.uk/dataset/b553d9ed-511f-4d65-a72d-782dea47bc8c/mod-ministerial-gifts-hospitality-travel-and-meetings-january-to-december-2019
MOD exceptions to spending controls for January to December 2019	1	Open data	https://data.gov.uk/dataset/10501653-70f4-45ac-a279-08cff2025b71/mod-exceptions-to-spending-controls-for-january-to-december-2019
MOD: non-consolidated performance related pay 2017 to 2018	1	Open data	https://data.gov.uk/dataset/954bb26d-6252-4bbf-8047-c27922f2bf86/mod-non-consolidated-

			performance-related-pay-2017-to-2018
International defence expenditure	1	Open data	https://www.gov.uk/government/publications/international-defence-expenditure-2019
Overal assesment	**Many**	**Open data**	
Procurement (++)			
MOD trade, industry and contracts: index	Many	Open data	https://www.gov.uk/government/statistics/mod-trade-industry-and-contracts-2019
MOD regional expenditure with UK industry and supported employment: index	1	Open data	https://www.gov.uk/government/statistics/mod-regional-expenditure-with-uk-industry-and-supported-employment-201819
Overall assesment	**Many**	**Open data**	
Legislation (++)			
Legislation	Many	Public data (low)	https://www.legislation.gov.uk/
Overall assesment	**Many**	**Public data (low)**	
Personnel information (+)			
UK armed forces biannual diversity statistics: index	1	Open data	https://www.gov.uk/government/statistics/uk-armed-forces-biannual-diversity-statistics-2019
MOD sponsored cadet forces statistics: index	1	Open data	https://www.gov.uk/government/statistics/mod-sponsored-cadet-forces-statistics-2020
Quarterly service personnel statistics: index	1	Open data	https://www.gov.uk/government/statistics/quarterly-service-personnel-statistics-2020
MOD diversity dashboard: index	1	Open data	https://www.gov.uk/government/statistics/mod-diversity-dashboard-2020
MOD biannual civilian personnel statistics:index	1	Open data	https://www.gov.uk/government/statistics/mod-biannual-civilian-personnel-report-2020
MOD civilian performance management outcomes	1	Open data	https://www.gov.uk/government/statistics/mod-civilian-performance-management-outcomes-financial-year-201819

MOD civilian sickness absence annual statistics: index	1	Open data	https://www.gov.uk/government/statistics/mod-civilian-sickness-absence-financial-year-2019
Location of all UK regular service and civilian personnel annual statistics: index	1	Open data	https://www.gov.uk/government/statistics/location-of-uk-regular-service-and-civilian-personnel-annual-statistics-2019
Overall assesment	**Substantial**	**Open data**	

Health and medical information (+)			
Deaths in service	1	Open data	https://www.gov.uk/government/statistics/uk-armed-forces-deaths-in-service-2019
Operational deaths post World War 2	1	Open data	https://www.gov.uk/government/statistics/uk-armed-forces-operational-deaths-post-world-war-2-2020
Training and exercise deaths in the UK armed forces	1	Open data	https://www.gov.uk/government/statistics/training-and-exercise-deaths-in-the-uk-armed-forces-2020
Suicide and open verdict deaths	1	Open data	https://www.gov.uk/government/statistics/uk-armed-forces-suicides-2019
Amputation statistics	1	Open data	https://www.gov.uk/government/statistics/uk-service-personnel-amputations-financial-year-201819
UK armed forces and UK civilian operational casualty and fatality statistics	1	Public data (high)	https://www.gov.uk/government/statistics/uk-armed-forces-and-uk-civilian-operational-casualty-and-fatality-statistics-financial-year-20192020
Improvised Explosive Device (IED) events involving UK personnel on Op Herrick in Helmand Province, Afghanistan	1	Public data (high)	https://www.gov.uk/government/statistics/improvised-explosive-device-events-involving-uk-personnel-on-op-herrick-in-helmand-province-afghanistan
Health and safety statistics	1	Open data	https://www.gov.uk/government/statistics/defence-personnel-health-and-safety-statistics-financial-year-201819
Alcohol usage in the UK armed forces: 1 June 2016 to 31 May 2017	1	Public data (high)	https://www.gov.uk/government/statistics/alcohol-usage-in-the-uk-armed-forces-1-june-2016-to-31-may-2017

Medical discharges	1	Open data	https://www.gov.uk/government/statistics/uk-service-personnel-medical-discharges-financial-year-201819
Mefloquine (Lariam) prescribing in the UK armed forces	1	Open data	https://www.gov.uk/government/statistics/mefloquine-lariam-prescribing-in-the-uk-armed-forces-12-september-2016-to-31-march-2020
Mental health annual	1	Open data	https://www.gov.uk/government/statistics/uk-armed-forces-mental-health-annual-statistics-financial-year-201819
NHS commissioning population statistics	1	Open data	https://www.gov.uk/government/statistics/defence-personnel-nhs-commissioning-bi-annual-statistics-financial-year-201920
Defence Medical Rehabilitation Centre, Headley Court: inpatient 1(ward) attendance	1	Public data (high)	https://www.gov.uk/government/statistics/defence-medical-rehabilitation-centre-headley-court-inpatient-ward-attendance
Deliberate self harm in the UK armed forces	1	Public data (high)	https://www.gov.uk/government/statistics/deliberate-self-harm-in-the-uk-armed-forces-1-april-2010-to-31-march-2018
Mefloquine Hydrochloride prescribing in the UK armed forces: 1 April 2007 to 31 March 2015	1	Public data (high)	https://www.gov.uk/government/statistics/mefloquine-hydrochloride-prescribing-in-the-uk-armed-forces-1-april-2007-to-31-march-2015
UK armed forces mental health care delivered in the Primary Healthcare Setting 2013/14 to 2015/16 and AFCS awards for Service attributable Mental Health 6 April 2005 to 31 March 2017	1	Public data (high)	https://www.gov.uk/government/statistics/uk-armed-forces-mental-health-care-delivered-in-the-primary-healthcare-setting-201314-to-201516-and-afcs-awards-for-service-attributable-mental-heal
UK armed forces prescribed Mefloquine Hydrochloride and subsequent presentation to MOD specialist mental	1	Public data (high)	https://www.gov.uk/government/statistics/uk-armed-forces-prescribed-mefloquine-hydrochloride-and-subsequent-presentation-to-mod-specialist-mental-health-services-1-april-2007-to-30-september

health services: 1 April 2007 to 30 September 2015			
Overall assesment	**Substantial**	**Open data**	
Veterans (+)			
Career Transition Partnership, Ex-service personnel employment outcomes	1	Open data	https://www.gov.uk/government/statistics/career-transition-partnership-ex-service-personnel-employment-outcomes-financial-year-201819
Census 2011: Working age UK armed forces veterans residing in England and Wales	1	Open data	https://www.gov.uk/government/statistics/census-2011-working-age-uk-armed-forces-veterans-residing-in-england-and-wales
Falklands deaths	1	Open data	https://www.gov.uk/government/publications/mod-national-and-official-statistics-by-topic/mod-national-and-official-statistics-by-topic
Gulf 1 deaths	1	Open data	https://www.gov.uk/government/publications/mod-national-and-official-statistics-by-topic/mod-national-and-official-statistics-by-topic
War pension scheme	1	Open data	https://www.gov.uk/government/publications/mod-national-and-official-statistics-by-topic/mod-national-and-official-statistics-by-topic
Armed forces compensation scheme	1	Open data	https://www.gov.uk/government/publications/mod-national-and-official-statistics-by-topic/mod-national-and-official-statistics-by-topic
Location of armed forces pension and compensation recipients	1	Open data	https://www.gov.uk/government/publications/mod-national-and-official-statistics-by-topic/mod-national-and-official-statistics-by-topic
Annual population survey: UK armed forces veterans residing in Great Britain	1	Open data	https://www.gov.uk/government/publications/mod-national-and-official-statistics-by-topic/mod-national-and-official-statistics-by-topic

Overall assesment	**Substantial**	**Open data**	
Activitities of the Armed Forces (+-)			
The pattern of military low flying across the UK	1	1	https://www.gov.uk/government/collections/the-pattern-of-military-low-flying-across-the-uk-index
Overall assesment	**Some**	**Open data**	
Equipment of the Armed Forces (+-)			
UK armed forces equipment and formations	1	Open data	https://www.gov.uk/government/collections/uk-armed-forces-equipment-and-formations
Overall assesment	**Some**	**Open data**	

Datasets NL	Amount of datasets	Type of data	Reference
Budget (+-)			
Begroting Defensie	3	Open data	http://opendata.rijksbegroting.nl/
Begroting Defensie	1	Public data (low)	https://www.tweedekamer.nl/downloads/document?id=1613327f-6720-41e6-9c47-b66d838fde2b&title=Begroting%20Defensie%202020.pdf
Begroting Defensie	1	Public data (low)	https://www.rijksoverheid.nl/documenten/begrotingen/2018/09/18/x-defensie-rijksbegroting-2019
Overall assesment	**Some**	**Open data**	
Spending (+-)			
Inkoopdata Defensie	45	Open data	https://data.overheid.nl/community/organization/ministerie_van_defensie
Overall assesment	**Some**	**Open data**	
Procurement (+-)			
Inkoopdata Defensie	45	Open data	https://data.overheid.nl/community/organization/ministerie_van_defensie
Aankondingen aanbestedingen defensie	n/a	n/a	https://www.tenderned.nl/tenderned-tap/aankondigingen/search/defensie
Overall assesment	**Some**	**Open data**	
Legislation (++)			
Wetgeving Defensie	Many	Public data (low)	https://puc.overheid.nl/mp-bundels/
Overall assesment	**Many**	**Public data (low)**	
Personnel (-)			
Organorgram	1	Public data (low)	https://www.rijksoverheid.nl/documenten/brochures/2018/03/19/kerngegevens-defensie---feiten-en-cijfers

Personeelsrapportage	1	Public data (low)	https://www.rijksoverheid.nl/documenten/rapporten/2020/05/20/personeelsrapportage-defensie-2019
Overall assesment	**Some**	**Public data (low)**	
Health & medical information (--)			
n/a			
Veterans (-)			
Veteranennota	1	Public data (low)	https://www.veteraneninstituut.nl/content/uploads/2020/06/Veteranennota2019-2020.pdf
Veteranenmonitor	1	Public data (low)	https://www.veteraneninstituut.nl/content/uploads/2019/12/Veteranenmonitor-2019-Rapportage.pdf
Overall assesment	**Some**	**Public data (low)**	
Activities of the Armed forces (+-)			
Weekoverzichten F-16 inzet anti-ISIS coalitie 2014, 2015, 2016 en 2018	3	Open data	https://data.overheid.nl/dataset/weekoverzichten-f-16-inzet-anti-isis-coalitie-2014-2015-2016-en-2018
Nederlandse militaire bijdrage aan internationale missies en operaties	1	Public data (low)	https://www.rijksoverheid.nl/documenten/brochures/2018/03/19/kerngegevens-defensie---feiten-en-cijfers
Locatie van eenheden	1	Public data (low)	https://www.rijksoverheid.nl/documenten/brochures/2018/03/19/kerngegevens-defensie---feiten-en-cijfers
Overall assesment	**Some**	**Open data**	
Equipment of the Armed forces (-)			
Equipment of armed forces	1	Public data (low)	https://www.rijksoverheid.nl/documenten/brochures/2018/03/19/kerngegevens-defensie---feiten-en-cijfers

Overall assesment	**Some**	**Public data (low)**	

Datasets US	**Amount of information**	**Type of data**	**Links**
Budget (+)			
Budget	Substantial	Public data (high)	https://comptroller.defense.gov/Budget-Materials/
Overall assessment	Substantial	Public data (high)	
Spending & Procurement (++)	Over 50 million hits		
Hopkins	1	Public data (high)	https://beta.sam.gov/awards/90872862%2BAWARD?keywords=&sort=-modifiedDate&index=fpds&is_active=true&page=1&organization_id=100000000
Xeros	1	Public data (high)	https://beta.sam.gov/awards/64399508%2BAWARD?keywords=&sort=-modifiedDate&index=fpds&is_active=true&page=1&organization_id=100000000
Lockheed Martin	1	Open data	https://www.usaspending.gov/#/award/CONT_AWD_N0001917C0001_9700_-NONE-_-NONE-
Boeing company	1	Open data	https://www.usaspending.gov/#/award/CONT_AWD_FA863412C2651_9700_-NONE-_-NONE-
Electric Boat Coperation	1	Open data	https://www.usaspending.gov/#/award/CONT_AWD_N0002417C2100_9700_-NONE-_-NONE-
Abu Dhabi National Oil Company	1	Open data	https://www.usaspending.gov/#/award/CONT_AWD_B001_9700_SP060010D0458_9700
Emerson Construction Company, INC.	1	Open data	https://www.usaspending.gov/#/award/CONT_AWD_W912QR08C0053_9700_-NONE-_-NONE-

NORTHROP GRUMMAN SYSTEMS	1	Open data	https://www.usaspending.gov/#/award/CONT_AWD_N0001908C0023_9700_-NONE-_-NONE-
HUNTINGTON INGALLS INCORPORATED	1	Open data	https://www.usaspending.gov/#/award/CONT_AWD_N0002408C2110_9700_-NONE-_-NONE-
Information Security Grants	1	Public data (high)	https://beta.sam.gov/fal/b700c54aff444a9c87cb43dd6195e436/view?keywords=defense&sort=-relevance&index=&is_active=true&page=1
Overall assessment	**Many**	**Open data**	
Geography (+)	277 datasets		
FUDS (formerly used defense sites)		Open data	https://catalog.data.gov/dataset/fomerly-used-defense-sites
National Channel Framework		Open data	https://catalog.data.gov/dataset/national-channel-framework
SAGA Online - Sediment Analysis		Open data	https://catalog.data.gov/dataset/saga-online-sediment-analysis-geo-application
dsl pub		Open data	https://catalog.data.gov/dataset/dsl-pub
ChannelArea		Open data	https://catalog.data.gov/dataset/channelarea
DQM Vessel Locations Pipeline		Open data	https://catalog.data.gov/dataset/dqm-vessel-locations-pipeline
Access to Water Resources Data		Open data	https://catalog.data.gov/dataset/access-to-water-resources-data-3cca3
Submit TLP Case Study fieldworker		Open data	https://catalog.data.gov/dataset/submit-tlp-case-study-fieldworker
National Inventory of Dams		Open data	https://catalog.data.gov/dataset/national-inventory-of-dams-41656
RSM Mapper (Mapping Application)		Open data	https://catalog.data.gov/dataset/rsm-mapper-mapping-application
Overall assessment	**Many**	**Open data**	
Legislation (++)			
Legislation	Many	Public data (low)	https://www.congress.gov/
Overall assessment	**Many**	**Public data (low)**	

Personnel (+)			
DoD Personnel, Workforce Reports & Publications	1		https://www.dmdc.osd.mil/appj/dwp/dwp_reports.jsp
Department of Defense by Gender, Race and Ethnicity	1		https://diversity.defense.gov/Portals/51/Documents/Presidential%20Memorandum/DoD%20Military%20by%20Gender%20Race%20and%20EthnicityV2.pdf?ver=2017-01-06-090352-110
Medical and Health(-)			
Number of Service Members Diagnosed with Traumatic Brain Injury	some	Public data (high)	https://dvbic.dcoe.mil/dod-worldwide-numbers-tbi
Overall assesment	**some**	**Public data (high)**	
Veteran	576 datasets		
Opioid Prescribing Rates at VA Facilities 2012 - 2018	Many	Open data	https://www.data.va.gov/browse?limitTo=datasets
Gravesite locations of Veterans and beneficiaries in LOUISIANA, as of November 2018.	Many	Open data	https://www.data.va.gov/browse?limitTo=datasets
Overall assesment	**Many**	**Open data**	**https://www.data.va.gov/browse?limitTo=datasets**
Activities of the Armed forces (-)			
Casualty and injury data	Some	Public data (high)	https://www.dmdc.osd.mil/appj/dwp/stats_reports.jsp
Overal assesment	**Some**	**Public data (high)**	
Equipment of the Armed forces (--)			
n/a	n/a		