Using Big Data in the Public Sector

Uncertainties and Readiness in the Dutch Public Executive Sector

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Abstract

Government organizations recognize the opportunities offered by Big Data technologies, but are postponing Big Data Use implementation decisions as they are unsure if they are actually ready for its implementation. Organizations struggle with the assessment of their readiness for Big Data use implementation. By identifying pointers from literature and combining them with practical experience and perspectives from the Dutch public executive sector a Big Data Readiness framework is established, which helps public sector organizations with determining their Big Data readiness and identifying point they can improve on. The framework is tested and a first indication of the Big Data readiness of eleven organizations in the Dutch public executive sector is provided. Currently, the Dutch public executive sector is not ready to implement Big Data use and should work on developing their organizations further to be able to use Big Data in the future.

Key words: Big Data, Public Sector, E-government, T-Government, Using Big Data, Using Big Data, Maturity, Capabilities.

1. Introduction and Background

Digital data from a rapidly growing number of new technological data sources, such as mobile devices, social media and other digital applications is flooding the world (The Economist, 2010). And with advancements in computational, storage and analytical technology, the tools to handle and use that flood of data are now becoming available and economical (Bryant, Katz, & Lazowska, 2008). The combination of enormous volumes of digital data and technological advancement create the dawn of the age of Big Data (Lohr, 2012). Big Data is data so large, varied and dynamic that it cannot be handled by conventional data processing technology. By using advanced technologies to combine and analyze this type of data, information can be made visible that was undiscoverable in the past. According to authors, such as Mayer-Schönberger & Cukier (2013), firms, government and science can significantly benefit from this revolutionary way of knowledge discovery.

The private and science sectors are starting to use Big Data in their everyday activities. Big companies from retail, such as Walmart (Bryant, Katz, & Lazowska, 2008), Sears (Henschen, 2012), and Amazon (Kelly, 2013) are using Big Data to attempt to better understand their customers and their buying choices. Financial institutions, such as Morgan Stanley (Groenfeldt, 2012) are using Big Data to more accurately predict market behavior and investment performance. Online companies, such as Google, eBay, Twitter and Facebook have created their entire business model around huge volumes of digital data on individuals behavior, sentiment, information requests and preferences (Simon, 2013; Davenport & Dyché, 2013). Furthermore, Big Data is enabling large science programs, such as the Large Hadron Collider in Geneva and the future Large Synoptic Survey Telescope in Chile to make significant contributions to the fields of physics and astronomy (Mayer-Schönberger & Cukier, 2013).

But as the private and science sectors are increasingly using Big Data to improve their performance, the public sector is falling behind (Mullich, 2013). And that while Big Data also has substantial potential value for the public sector. Big Data can help government become more effective, more efficient and more transparent (Joseph & Johnson, 2013), and with that it provides a significant opportunity for the public sector to make a much desired leap in its performance. The value of using Big Data for the public sector is that Big Data can potentially provide it with higher quality decision making and a better understanding of the environment, citizen demands and trends, based on more information, and faster discovery, reaction and execution because of more information becoming available and insightful much faster (Bertot & Choi, 2013). With these benefits, Big Data will allow the public sector to make substantial progress in solving lingering societal problems, such as transport congestion, health care quality and costs and the sustainable energy transition (Scholl & Scholl, 2014).

Big Data is an information technology that, enables the further development of government in efficiency, effectiveness and transparency, similar to the goals of e-government development (Weerakkody, Janssen, & Dwivedi, 2011). IT-enabled reform of government is primarily described in e-government literature (Cordella & Bonina, 2012; Heeks, 1999), and Big Data is regarded in this article as an enabler of e-government development. Furthermore, Big Data use has the potential to radically advance government performance through lower cost (Milakovich, 2012), higher quality and faster insights in the environment and citizens demands (Policy Exchange, 2012), resulting in better and faster decision making (Puron-Cid, Ramon Gil-Garcia, & Luna-Reyes, 2012), policy evaluation, design and execution (Bertot & Choi, 2013) and an increase in transparency (Dawes, 2010). Because of this potential, Big Data can help government organizations substantially improve and structurally reform towards the end-state of e-government development, so-called digital-era or transformational government (Margetts & Sutcliffe, 2013), (Joseph & Johnson, 2013), (Rajagopalan & Solaimurugan, 2013).

Although public sector managers are very interested in using Big Data (Mullich, 2013), the public sector is still in an orientation phase regarding Big Data (Federal Big Data Commission, 2012; Ministerie van Infrastructuur en Milieu, 2014). Currently, Big Data is not used in the public sector (Toorn, 2014). Many organizations, in both the private and public sector, are promoting data intensive decision making in their organizations, but are contemplating the step towards using Big Data, as they are unsure if their organizations are ready for it (Malik, 2013). According to the Dutch Ministry of Internal Affairs, organizations in the Dutch public sector are not ready to start using Big Data yet, but need significant further development first (Ministerie van Binnenlandse Zaken en Koningsrijkrelaties, 2012). Although this assessment of the readiness for using Big Data in the public sector may make a valid point, it remains unclear how far the development towards using Big Data in the public sector currently is. Additionally, the further developments needed before public sector organizations are ready for Big Data are not specified and remain unclear for both practitioners and academics.

A thorough assessment of the readiness for Big Data in the public sector and an overview of its possible areas of improvement is needed to provide practitioners and academics with information that enables them to contribute to the development of Big Data in the public sector. Assessments of Big Data readiness in public organizations will provide insights into what areas need to be developed further to enable the public sector to take advantage of the potential value of using Big Data. Unfortunately, as Big Data is a very new concept, no clear cut assessment method for the organizational readiness for Big Data is available. By combining insights from practice with established concepts from academic literature, a suitable framework for Big Data Readiness assessment in proposed in this article to help practitioners and academics to determine how best to develop the public sector further towards the use of Big Data. Furthermore, by connecting the concept of Big Data with current grounded academic

knowledge, the concept of Big Data can be demystified further. A better view at Big Data will improve the understanding of the concept for both practitioners and academics, leading to faster development of and more effective knowledge creation on Big Data.

2. Research

In order to be able to provide an overview of the Big Data Readiness of organizations in the public sector and to formulate a framework to assess it, an exploratory research project is conducted. The research project consisted of three steps. In the first research step, interviews were held with practitioners to establish the current situation regarding the use of Big Data in the public sector. Additionally, their experience with intensive data use in their organizations was combined with Big Data specific literature to create handles on the concept of Big Data that allows the researcher to connect it to more established academic concepts in research step 2. In the second step, the findings from the first step are used as starting points for the formulation of the new framework. The new framework is created by adapting established concepts from literature to Big Data and public sector specific points, which are derived from the interviews and literature used in research step 1. Finally, in research step 3 the new framework is used to establish a first overview of Big Data Readiness in the public sector and to provide possible areas of improvement. The approach taken in the research project described above is also depicted in Figure 1.
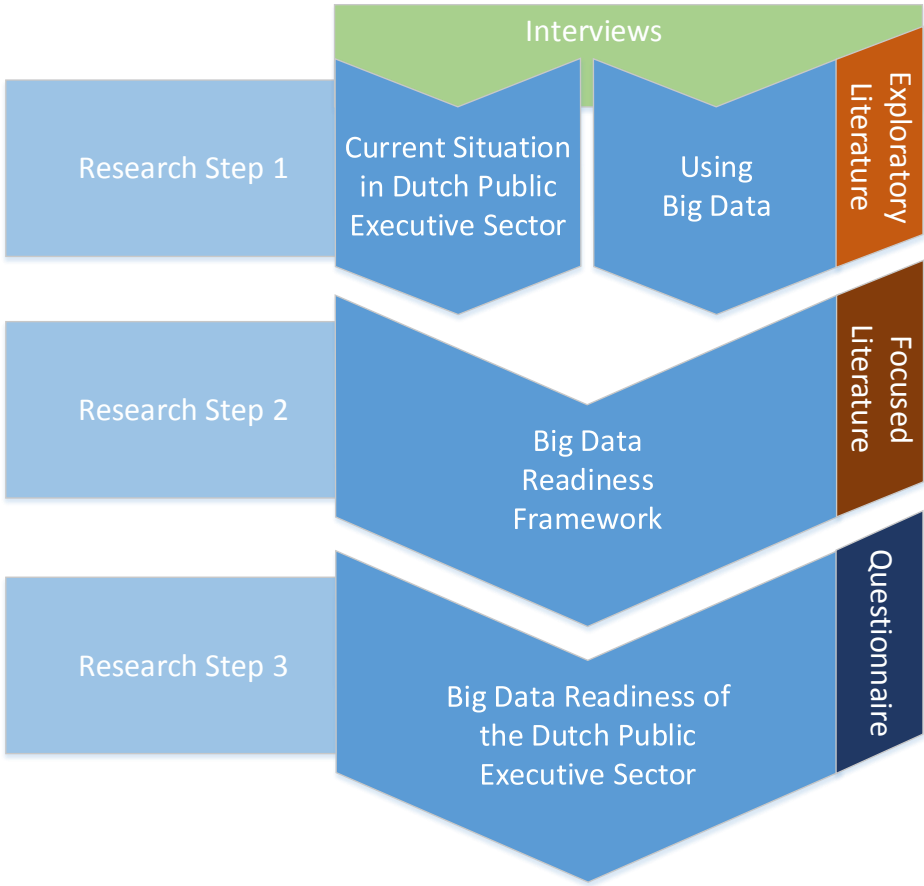

Figure 1: Research Approach

The information from practice was gathered from eleven public officials from the Dutch public executive sector through unstructured interviews in the first research step and a questionnaire in the third step. The Dutch public sector was selected as it provides a very developed and stable public sector and as the Netherlands is one of the leading countries in the world in e-government indexes, such as the UN e-government survey 2014 (United Nations Department of Economic and Social Affairs, 2014). It is assumed that because of these attributes the Dutch public sector is one of the most advanced public sector regarding the development and interest in Big Data technologies. Furthermore, the executive branch of the Dutch public sector was selected, as organizations in this sector daily work with large volumes of substantive data and use it in their main activities. As large volumes of substantive data are the main resource for Big Data applications, the organizations in this sector are assumed to be the leading edge in the development of the use of Big Data in the public sector.

3. Using Big Data

Big Data is currently most often defined as data so large, fast and varied that conventional hardware and software are not able to process it (Laney, 2001). However, due to the fast advancement in technology, this definition is dynamic, and therefore hard to express in specific and measurable terms. Furthermore, what is conventional hardware and software will differ from industry to industry and organization to organization, so generalizing what data constitutes Big Data is very hard to do. In other words, the currently used definition of Big Data in literature does not help us to understand Big Data. Therefore a different approach is suggested in this article. By describing the use of Big Data in organizations instead of Big Data itself, the complexity of its dynamic and specific nature can be overcome by describing the way these dynamics are handled in organizations. The concept of using Big Data is explained in three steps.

Big Data Use Characteristics

The first step in describing the use of Big Data is clarifying the difference between the use of conventional, digital data and the use of Big Data. By combining literature on the definition of Big Data and its related aspects (Adrian, 2011; Chen, Mao, & Liu, 2014; IDC, 2011; OpenTracker, 2013; Mayer-Schönberger & Cukier, 2013; Simon, 2013; Davenport, Barth, & Bean, 2012) and insights and experience of practitioners from the Dutch public executive sector, the following five differentiating characteristics are formulated that describe the difference between using conventional data and using Big Data:

1. The use and combination of multiple large datasets, from both external and internal sources.
2. The use and combination of structured and unstructured data in analysis activities.
3. Real-time or near-real-time streams of incoming data which are structurally handled and analyzed.
4. The use of advanced analytics and algorithms, distributed computing and/or advanced technology to handle very large and complex computing tasks.
5. *Innovative use of existing datasets and/or data sources for new and radically different applications.*

It has to be noted that for data use to qualify as the use of Big Data it does not have to have all five of the above mentioned characteristics. However, data use that has a combination of three or more of the characteristics is qualified as Big Data use in this article.

Using Big Data Process

The second step in describing using Big Data is the formulation of the activities in the process of using Big Data. The activities is the process of using data are steps in the value chain of data, which take it from raw data in the environment, to actionable knowledge for decision makers. By describing these activities, the unique consequences and aspects of Big Data use can be coupled to their specific data activities. Many of these data activities and processes are most likely already present within public executive organizations, but probably not (completely) geared towards using Big Data.

From the additions on data value chains and knowledge creation processes from data of a large number of authors, technology consultants and vendors, four Big Data Use activities are formulated (Bryant, Katz, & Lazowska, 2008; Chen, Mao, & Liu, 2014; Cumbley & Church, 2013; Federal Big Data Commission, 2012; Miller & Mork, 2013). The four activities of using Big Data are: Collection, Combination, Analytics and Use. The four identified activities were also all repeatedly mentioned and recognized by practitioners in the interviews as important activities in their current data process and anticipated future Big Data process. The four identified activities are combined into a cyclical data use process that reflects its continues nature, including a feedback loop from the use of the data to the collection of new data. The cyclical process also shows the direction of the flow of information within the process.
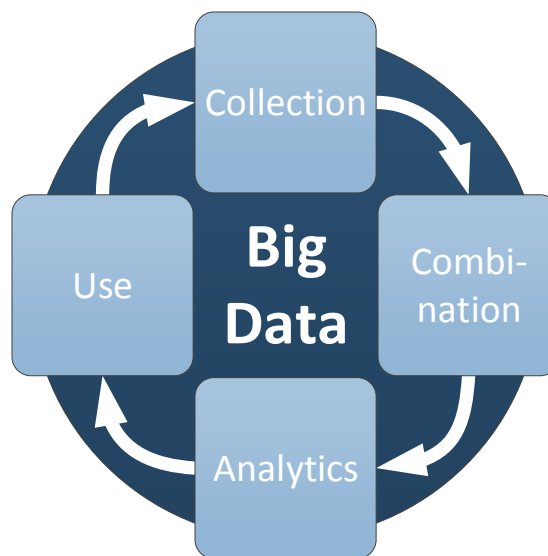

Figure 2: Using Big Data Process

Big Data Applications

The third and final step in explaining the use of Big Data in organizations is formulating a typology of possible Big Data applications. Although one of the most attractive features of Big Data use is that it can be applied to virtually any situation on which data is available and that the possibilities of using that data are numerous, some handles on this huge landscape of Big Data applications will enhance both insight and communication on the subject.

Multiple examples of planned Big Data applications discussed in the interviews with practitioners and found in literature, as described in the introduction, can be found that together give a glimpse of what is possible with Big Data. By exploring these examples in light of the Big Data Use characteristics they entail, its driving Big Data Use activity and its expected added value, three distinct types of Big Data applications can be identified. The three types are presented in Table 1.

Application type	Object evaluation	Research	Continues Monitoring
Prominent Big Data Use Characteristics	- Internal & External Datasets - Innovative use of existing data - Advanced Analytics & Algorithms	- Internal & External Datasets - Structured & Unstructured data - Advanced Analytics & Algorithms	- Real-time or near real-time - Advanced Analytics & Algorithms - Innovative use of existing data
Initial Big Data activity	Combination	Analytics	Collection
Added value	Decision support information	New insights	Richer Image of Reality

Table 1: Big Data Application Types

4. Formulation of a Big Data Readiness framework

A stated earlier, the starting points for the formulation of the new framework are retrieved from the experience of practitioners from the Dutch public executive sector, as they can best indicate where the uncertainty on the Big Data Readiness of their organizations comes from. In the interviews the practitioners indicate that there are several aspects that are creating the uncertainty on the readiness to start using Big Data. Firstly, it is unclear if Big Data is suitable or applicable in every organization and in what form Big Data can best be applied in organizations. Secondly, practitioners indicate they question whether their organizations are mature enough to make the required changes to take full advantage of the potential value of Big Data. Lastly, it is hard to establish whether public organizations are actually capable of working with Big Data successfully or not. The new framework is formulated with these three uncertainties as starting points, so that the framework addressed the main issues experienced in practice and can significantly contribute to the development of Big Data use in the public sector. The new framework is therefore formulated using three aspects, organizational alignment, organizational maturity and organizational capabilities, as is depicted in Figure 3.
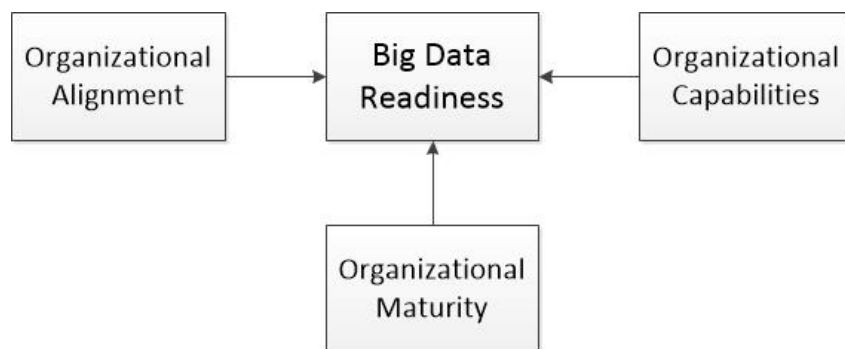

Figure 3: Big Data Readiness Framework

Organizational Alignment

Malik (2013) couples Big Data readiness assessment with IT-business alignment assessment and for good reason. Proper alignment of Big Data projects with the organization they will be executed in is key to Big Data success (Kiron, 2013). Currently no Big Data alignment theory is formulated, so existing IT alignment theory will have to be adapted towards Big Data for it can be used to assess Big Data readiness. So, the framework used as a basis for the alignment assessment is the strategic alignment

model, formulated by Henderson & Venkatraman (1993). The main notion taken from the model is that business strategy, IT strategy, organizational infrastructure and IT infrastructure should be aligned with each other, as they are interconnected within the organization.

To make the strategic alignment model more geared towards Big Data applications in the public sector, the four aspects of the model are adapted to more Big Data and public sector specific and relevant aspects. Organizational strategy is expressed in typologies of the main statutory tasks of public organizations. Organizational infrastructure is translated into the intensity in which the strategic (Big) Data Use activities described in the process of using Big Data are currently executed in the organization. IT strategy is adapted towards the three Big Data application types formulated previously. Lastly, IT infrastructure is expressed in the respective Big Data Use characteristics needed for the different Big Data application types.

From comparing Big Data characteristics, Big Data application plans, current data activities and current statutory tasks derived from the interviews with practitioners, Table 2 with the optimal organizational alignment of Big Data application types can be formulated.

Organization type	1	2	3	4
Main Statutory Task	Coordination, project-based task, no data use	Research, Evaluation	Registration, Documentation	Administration, Management
Data Collection Activity Intensity	Low	Low	High	High
Data Use Activity Intensity	Low	High	Low	High
Most present Big Data Use Characteristics	-	- Internal & External Datasets - Structured & Unstructured data - Advanced Analytics & Algorithms	- Internal & External Datasets - Innovative use of existing data - Advanced Analytics & Algorithms	- Real-time or near real-time - Advanced Analytics & Algorithms - Innovative use of existing data
Best Aligned Big Data Application type	-	Research Applications	Object/Subject Evaluation Applications	Continues Monitoring Applications

Table 2: Optimal Organizational Alignment

The first part of the Big Data readiness assessment of organizations in the Dutch public executive sector can be performed by evaluating if the main statutory task (organizational strategy) and strategic data activities (organizational infrastructure) are in alignment with the planned Big Data application type (IT strategy) and supporting Big Data Use characteristics (IT infrastructure). The assessment of the organizational aspects is established based on answers to the specifically design questionnaire. The assessment of the IT aspects is conducted by questioning the three Big Data application types on four dimensions: interest in the application type, need for its specific benefits, its applicability in the organization and its current feasibility.

Organizational Maturity

Organizational Maturity of public organizations is important as it indicates how far these organizations have developed towards a state in which they cooperate better with other public organizations and provide more citizen oriented services and demand driven policies. As stated in the introduction, Big Data in an important enabler of these development, but vice-versa, these developments also help Big Data use be more effective. With more cooperation and more attention to citizen demands, more data is available for Big Data applications, which can be designed to better suit the demands of citizens. So, the maturity of the organization is not only a beneficiary of Big Data use implementation, but also an indicator of how well an organizations is able to use it to its full advantage. Therefore, organizational maturity is an important aspect of the assessment of Big Data Readiness in public organizations.

The established frameworks to assess public sector organization maturity on e-government are the e-government growth stage models. In these models IT-enabled reforms of government are described to usually follow a certain growth path which are presented in growth stage or maturity models with multiple distinct steps (Layne & Lee, 2001; Andersen & Henriksen, 2006; Klievink & Janssen, 2009). Although full assessment of e-government maturity using these framework falls outside of the scope of this research project, the five described stages of the Klievink & Janssen (2009) model and their description are used as a basis to assess in which stage of e-government development public organizations currently are. The Klievink & Janssen (2009) model is chosen, as this model recognizes the inter-organizational aspects of e-government development, which also plays a very significant role in Big Data development.

The e-government growth stages in Table 3 are based on the growth stages identified and described in this model. The corresponding characteristics of the five stages, expressed in activities and information sharing and IT facilities are based on the description given in the article and on the views on organizational maturity for e-government initiatives expressed by practitioners in the interviews. Also, from the interviews a development- or time-path in data systems/concepts within the organizations was deduced that, according to practitioners, had a significant connection to the development of e-government growth stages. To further assess organizational maturity in respect to Big Data Use implementation, these systems and concepts are also added to the characteristics in Table 3.

	e-government growth stage	Activities and Information sharing	IT facilities	Data systems/concepts
1	Stove-piped organizations	Information and activities are bounded within separate departments within the organization	All activities are, where possible, supported by IT	Digitalization of processes
2	Integrated organizations	Activities transcend the separate departments and information is shared throughout the organization	A organization-wide IT infrastructure in which information is accessible throughout the organization	Business Intelligence & Data Management
3	Nationwide portal	The activities go beyond the boundaries of the organization and information	IT infrastructure suited for external access of	Business Intelligence 2.0 & Data Management 2.0

		is accessible from outside of the organization	applications and information within the organization	
4	Inter-organizational integration	Activities and information is extensively sharing with other organizations	IT infrastructure suited for full access of applications and information for other organizations	Open Data
5	Demand driven, joined-up government	Activities and information is organized centrally and made available to all relevant organizations and stakeholders	Centrally Built IT facilities supporting all information and applications and fully accessible for all involved stakeholders	Big Data

Table 3 :E-government Growth Stages and Characteristics

The most dominant e-government growth stage of a public organization is established by asking practitioners which of the characteristics from Table 3 are present in their organization in the questionnaire. This will give important insight in how mature the organization is in respect to e-government initiatives and Big Data enabled transformational government in particular.

Organizational Capabilities

Klievink & Janssen (2009) further develop the growth stage model by adding that advancement towards further stages of e-government development are based on the development of the required capabilities for those stages and that those advancement therefore do not need to be sequential. That development to advanced stages need not be sequential creates the need for an additional assessment method for the readiness for Big Data use implementation for public organizations. As merely assessing in which stage public organizations currently are, only described the extent of the developments required and does not give a complete assessment of readiness. This observation, in combination with the notion of capabilities enabling advancement brings us to the third assessment method from literature.

Valdès et al. (2011) developed an assessment method, named the e-government maturity model, based on capability levels relevant to e-government initiatives implementation and execution. The methods used in this maturity model can be adapted towards Big Data use implementation and execution to assess the specific readiness for Big Data within public organizations by using a different set of capabilities, specifically geared towards Big Data use.

The organizational capabilities considered vital for Big Data Use in the public sector organizations are established through analyses of capabilities mentioned in several, relevant research fields in literature. Capabilities from literature in IT Adoption (Jeyaraj, Rottman, & Lacity, 2006; Ebrahim & Irani, 2005; Kamal, 2006), IT Implementation (Ngai, Law, & Wat, 2008; Premkumar, 2003; Yeoh & Koronios, 2010; Finney & Corbett, 2007; Wixom & Watson, 2001), Innovation Adoption (Waarts, Everdingen, & Hilligersberg, 2002; Robey, Im, & Wareham, 2008), Dynamic and Core Capabilities in IT (Daniel & Wilson, 2003; Lin & Hsia, 2011; Klievink & Janssen, 2009; Wu & Hisa, 2008) and from Big Data specific literature (Chen, Mao, & Liu, 2014; Courtney, 2012; McAfee & Brynjolfsson, 2012; Milakovich, 2012;

Ross, Beath, & Quaadgras, 2013; Tambe, 2014) are combined with commonly mentioned capabilities in the interviews with practitioners. From this, a list of seven overarching capabilities is compiled for the assessment of organizational capabilities for the use of Big Data. The list is presented in Table 4.

Capability	Explanation
IT Governance	Capability to design and develop IT strategy, decision making and responsibility structures, supporting the organization. This includes integration of new IT systems.
IT Resources	Capability to design, develop and maintain suitable IT infrastructure and expertise to facilitate current and new IT systems.
Internal attitude	Capability to develop internal commitment and vision for new processes and systems. Especially openness towards data driven decision making.
External attitude	Capability to develop external commitment and support for new processes and systems with important stakeholders.
Legal Compliance	Capability to design and develop a compliance strategy including process design, monitoring and redesign of processes. Specifically for data use on privacy protection, security and data ownership regulations.
Data Governance	Capability to design and develop a data strategy including collection, acquisition, quality control and data partnerships.
Data Science Expertise	Capability to bundle/acquire, develop and retain data science knowledge in the organization. Specifically bundling of IT, core business & mathematics knowledge.

Table 4: Organizational Capabilities for Big Data Use

The seven identified organizational capabilities are assessed on three dimensions; importance for Big Data success in the organization, possibility to develop capability in the organization and current presence of the capability within the organization. Based on the assessment methods used by Valdès et al. (2011), the assessment on each capability is derived from comparing given scores to the maximum score. This will give an assessment per capability for each organization, which can be used to compute the overall organizational capability assessment. This will give further insight into the Big Data readiness of organizations in the Dutch public executive sector.

5. Application of the Big Data Readiness Framework in the Dutch Public Executive Sector

As stated in the introduction, an overview of the readiness for using Big Data in the public sector and its areas of improvement is needed for its further development. Now that the framework is formulated, it is time to apply it to public organizations from the Dutch public executive sector. This will show how the framework is able to provide the overview needed by practitioners and academics.

The results from the questionnaires filled in by public officials from the Dutch public executive sector are analyzed with the Big Data Readiness Framework to establish the assessment presented in Table 5. The assessments show that the organizational alignment of planned Big Data applications is reasonably developed with an average assessment of Medium. This indicates that organizations in the Dutch public executive sector have a reasonably good understanding of Big Data applications and its implications for their organizations. The average assessment on organizational maturity is Low. The assessment shows that most organizations are not structurally cooperating in sharing information and

activities, which means more development will be needed before they will be able to take full advantage of the possibilities Big Data is offering. Organizational capabilities is assessed on average as Medium. Organizations are developed in the capabilities required to use Big Data, but are not at a level that will allow them to make effective use of it. After adding up the three assessments, the overall Big Data Readiness is established. The average Big Data Readiness of organizations in the Dutch public sector is Medium. This means the organizations are developing the requirements for using Big Data, but are not ready for it yet. Further development is needed, before Big Data can and should be used by the organizations in the Dutch public executive sector.

#	Organizational Alignment	Organizational Maturity	Organizational Capabilities	Big Data Readiness Assessment
1	Very High	Low	Medium	Medium
2	Medium	Medium	Medium	Medium
3	Low	Very Low	Low	Very Low
4	High	Low	High	Medium
5	Very Low	Very High	Low	Medium
6	Medium	Low	Medium	Medium
7	High	Low	High	Medium
8	Medium	Very Low	High	Medium
9	Very Low	Very Low	Low	Very Low
10	Medium	Very Low	High	Medium
11	Medium	Low	Medium	Medium
Ave.	**Medium**	**Low**	**Medium**	**Medium**

Table 5: Big Data Readiness in Dutch Public Executive Sector

From the assessments made with the Big Data Readiness Framework, a number of significant areas of improvement have been identified. These areas of improvement are identified by investigating the weakest points in the assessments of the organizations. Firstly, the organizational alignment can be improved by organizations if they make sure they currently only focus on Big Data applications that fit well with their organizations. Furthermore, public organizations with research statutory tasks can improve their alignment with Big Data applications by improving their data activities to support the combination of structured and unstructured data. Organizations with registration tasks should improve their data activities in such a way that they are able to make more innovative use of their data.

The organizational maturity of the organizations in the Dutch public executive sector can be improved by developing more structural cooperation between organizations. By sharing more information, activities and data with each other, the organizations will be able to provide their Big Data applications with more and more diverse input, creating more accurate and more informative insights from it. In the past only cooperation with organizations in the same field made sense, as relevant data and knowledge could mostly only be found there. The ability of Big Data technologies to add value from combining data from very different sources lifts this limitation and thus cooperation can be initiated with a much larger group of organizations.

The Big Data Readiness assessments further show that organizational capabilities can be improved most by focusing on the capabilities Data Science Expertise, Data Governance and IT Governance. Important to note is that cooperation between public organizations on the development of organizational capabilities can be very effective, as the organizations show a wide variety of strengths and weaknesses in the assessment of their organizational capabilities for Big Data. Cooperation with organizations with opposing strong and weak points could be very beneficiary for the development of readiness for Big Data in both organizations and with it in the whole public sector.

7. Conclusion

Big Data technologies offer significant potential value for public sector organizations. However, development and implementation of them is difficult, as practitioners are unsure whether their organizations are ready to use Big Data or not. To establish the readiness for Big Data of the public sector, experience from practice from the Dutch public executive sector was combined with the insights from established and related theoretical concepts from literature. From this the Big Data Readiness framework was formulated, containing aspects for organizational alignment, maturity and capabilities. The framework was used to assess the Big Data Readiness of organizations in the Dutch public executive sector. From the assessments made with the framework it can be concluded that the Dutch public executive sector is not ready for the introduction of Big Data use and should develop its readiness for Big Data use further first. The identified areas of improvement for the public sector provide helpful pointers for practitioners in their efforts to improve the Big Data Readiness of their organizations.

A second objective of this research project is to demystify the concept of Big Data to make it more understandable and usable for both practitioners and academics. By explaining the use of Big Data in organizations, the concept is given handles that make it more understandable and recognizable for practitioners and academics. Furthermore, the handles, in the form of differentiating characteristics, the Big Data activities and the three Big Data application types allow the concept to be connected with established academic concepts as e-government maturity, organizational change and IT implementation and core/dynamic capabilities of organizations. This connection will allow academics to better understand, describe and explain the concept of Big Data and its implications and extend our knowledge on it.

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