Gordon Institute of Business Science
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Stakeholder views on data governance components, objectives, accountability, enablers and inhibitors within the banking industry in South Africa

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Abstract

The rapid growth of data worldwide has highlighted a need to establish data governance in organisations. Furthermore, data related trends such as big data, the Internet of Things and digitisation are indicative of recognition that data is a strategic asset that can be a source of competitive advantage. However, most decision makers still struggling to trust the data they use to make critical decisions and comply to regulation due to a lack of standards and controls in the management of this asset. In light of this, this research paper explores the components, objectives, accountability and factors that either enable or inhibit data governance within the banking in South Africa.

A review of existing literature was done to establish current discourse on data governance constructs that form part of this research. Key themes in literature pertaining to these areas were identified and used to frame the research questions on which the findings were based.

An exploratory qualitative study was conducted in which eleven semi-structured interviews were done with data governance subject matter experts, data consumers, data creators and consultants within the banking industry in South Africa. In an effort to solicit a balanced view on the state of data governance in the industry, sampling was done across all groups mentioned above.

The research found that there was a consistent view on the components, objectives and accountability allocation of data governance. However there were varied views on the classification of factors as enablers and inhibitors of data governance.

Therefore a framework has been suggested that incorporates input from existing models found in literature and the findings from the research; especially with regards to factors that influence data governance.

Keywords

Data governance; components, accountability, enablers, inhibitors

Declaration

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

Name: Nthabiseng Seboka

Signature:

Date: 09 November 2015

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List of Abbreviations

CAO – Chief Analytics Officer
CDO – Chief Data Officer
CIB – Corporate and Investment Banking
CIO – Chief Information Officer
IT – Information Technology
IoT – Internet of Things
MDM – Master Data Management
RBB – Retail and Business Banking

1. Introduction to Research Problem

1.1 Background to Research Problem

Khatri and Brown (2010), Kooper, Maes and Lindgreen (2011) and Tallon, Ramirez and Short (2013) stated that the rapid growth of data worldwide and ease of access to it have highlighted a need to establish data governance in organisations. It is projected that the current data growth rate in organisations will continue on an upward trend in the foreseeable future (Tallon et al., 2013). As a result, organisations are increasingly recognising data as strategic asset from which business value can be derived (Khatri & Brown, 2010; Kooper et al., 2011). Kooper et al. (2011) further specified that organisations that establish some form of data governance are better positioned to leverage business value-add from data. Consequently, data is now considered a candidate for governance and as such has become a popular topic of discourse amongst practitioners (Kooper et al., 2011; Otto, 2011; Tallon et al., 2013). With the exception of Kooper et al. (2011), academic research in this field refers to data and information interchangeably (Khatri & Brown, 2010; Tallon et al., 2013; Weber, Otto & Österle, 2009). This research adopts a similar approach in reference to data governance accordingly.

Limited research has been conducted on data governance as opposed to IT governance (Tallon et al., 2013). Whilst early research in this field has focused on establishing a framework for data governance, Hagmann (2013) and Weber et al. (2009) postulated against a generic data governance framework design. They argued that an organisation's chosen design should be the result of a set of internal and external contingencies in the environment that drives business objectives. As a result of the infant stage of research in data governance and seemingly disparate views on the state of an established framework, most organisations find it difficult to constitute a group wide data governance strategy successfully (Weber et al., 2009).

1.2 Business Rationale for Research

Data has firmly been established and recognised as the currency of our age (Ayshford, 2012). This is supported by widely embraced and growing business trends such as big data changing how companies conduct business and use analytics to gain insights that help them understand their customers better; thus informing strategic decisions making

(Microsoft, 2013). It is therefore no surprise that big data is currently one of the top business trends and widely recognised for its potential to add business value. However this trend has also introduced new challenges for business pertaining to how to govern data (Clark, 2015).

Furthermore, the Internet of Things (IoT) has proliferated the addition of sensors and computing power to a range of daily items such as clothing and windmills, with the sole intent of using the data to discover trends and insights (Clark, 2015). This additionally propagates the volumes of data that organisations have to decipher in an attempt to cling insights.

However, amidst the growing need and use of data and analytics in companies, most decisions makers are still cynical of the insights presented, mainly due to a deficient understanding of the governance pertaining to the data used (Eitel-Porter & Millan, 2015). This finding was supported by a survey conducted by Gartner stipulating that as of 2015, 85 percent of Fortune 500 companies were still be unable to leverage their data for competitive advantage (Laney, 2012). To this end, KMPG insists that one of the key foundations required to leverage the data benefit for business expansion is setting a data governance model that will allow for the management of both structured and unstructured data (KPMG, 2012). In support of this rationale, Panian (2010) argued that organisations that successfully implement data governance are better positioned to leverage their data and gain a competitive advantage. This implies a need to not only establish data governance, but to also ensure that it is embedded within the organisation's culture.

Furthermore, as a consequence of the propagation of data and the exploitation thereof, there is growing consensus surrounding the need to secure personal information; this applies to both online as well as data captured and stored by the organisation (Union, 2015). This has led to the emergence of laws such as the right to be forgotten - a European Union law outlining strict legal conditions under which personal information can be gathered and stipulating the purposes for which it can stored (Union, 2015). A similar law in South Africa, the Protection of Personal Information (POPI), affects multiple industries, as it sets conditions concerning how companies process personal information and what they are allowed do with information they hold about their customers; thus promoting the safety and accuracy thereof (Luck, 2014). A breach of

these conditions and guidelines is said to lead to potential fines of about R10 million (Entrepreneur, 2013).

According to Rimes (2015), the financial investment industry is struggling to keep up with these data governance regulations and hence are not able to comply. This is evidenced by regular headlines regarding bank fines issued by regulators for non-compliance related to a lack of appropriate data governance. In 2014, South Africa's four main banks were collectively fined R125 million by the South African Reserve Bank due to a lack of proper anti-money laundering (AML) controls in their data processes (Barry, 2014). Part of this fine included penalties for keeping inadequate customer verification data and poor maintenance of transaction records (Bonorchis, 2014). A recent study indicated data availability and quality as the key issues respondents identified in relation to the fines (OTC Space, 2014).

As such, the Basel Committee recently outlined a new regulatory statute - The Basel Committee on Banking Supervision 239 (BCBS 239) - to highlight the inadequacy of data controls within financial institutions as a key contributor to the financial crisis at the start of 2007. To this end, the Basel Committee has published a set of data principles to be adhered to concerning risk data aggregation and management (Bank For International Settlements, 2013).

These regulations inherently support the need for data governance in organisations in order to mitigate the risk presented by circumstances such as those preceding the global financial crisis (Weber et al., 2009). However, according to Bennett (2008), most businesses lack a comprehensive data governance policy. As such, a gap exists between the data governance aspirations of most companies and actual implementation in the real world. It is this gap that led to regulatory bodies mandating policies to drive execution.

A supplementary indicator to highlight the prominence of data governance can be drawn from the emergence and rise of data governance solutions and technologies offered by consulting and IT companies in an effort to overcome the people, process and technology voids that currently exist and which are perceived to hinder the ability to implement data governance (Heale, 2014; Newman & Logan, 2006). This is supported by research that indicates an upward trend in the number of organisations

investing in formal data governance initiatives (Briggs, 2009).

1.3 Research Objectives and Motivation

Research in data governance is still in its infancy as scholars hypothesise the best approach to ensure a successful implementation (Donaldson & Walker, 2004). To this end, current academic research is still exploring possible frameworks to help contextualise data governance and attempt to determine an all-encompassing framework to aid companies in their data governance endeavours (Bennett, 2015; Khatri & Brown, 2010; Tallon et al., 2013).

The exponential growth of data and digital disruption experiences across all industries also warrants the need for data governance (Bennett, 2015). As per research conducted, the banking sector is one of the most data intensive industries and this further adds complexity as far as establishing and embedding a data governance strategy is concerned (Otto, 2011).

Additionally, there seems to be growing consensus that data and the governance thereof can no longer remain the responsibility of the Information Technology (IT) department, given the increasing recognition of data as a strategic asset (Ebbage, 2014; Redman, 2012). For this reason it has become imperative to determine the locus of control and responsibility for data governance to ensure that data is leveraged to drive strategic objectives (Bennett, 2015).

Furthermore Tallon et al. (2013) suggested a data governance framework that incorporates enablers and inhibitors of data governance which require further probing as to their applicability to industries.

The aim of this research paper is thus to add to the current body of knowledge on data governance through an exploratory evaluation of existing literature on this subject in as far as it pertains to the banking industry in South Africa. The industry was chosen based on the data intensive nature of their operations as mentioned earlier.

The objectives of the research are to firstly determine banking industry stakeholder perceptions on what the key components of data governance are as well as their views

on the objectives of undertaking such initiatives. It is hoped that this will set a foundation towards understanding further the roles and locus of accountability which are deemed critical to execute data governance in this industry.

Furthermore, the researcher endeavours to explore the implications of the enablers and inhibitors of data governance as introduced by Tallon et al. (2013) within the banking industry in South Africa.

It is hoped that these objectives will contribute towards a deeper understanding as to the limitations of data governance execution in this industry, especially in light of the proliferation of regulatory fines due to a lack of compliance to mandated data governance requirements (Barry, 2014; J Hagmann, 2013).

2. Literature Review

2.1 Introduction

This chapter outlines the literature review conducted by the author to explore the constituents and objectives of data governance, as well as the enablers and inhibitors associated with the successful execution of a data governance strategy. As part of this, the author investigated the current proposed data governance frameworks defined within the context of prevalent contingencies that affect the design and implementation of data governance within an organisation. The author further discusses the roles and accountability structures associated with a data governance structure.

2.2 Deconstructing Data Governance

According to Panian (2010), the evolution of data governance is rooted in the broader context of corporate and Information Technology (IT) governance, on which extensive research has been undertaken. The current research in this area draws heavily on corporate and IT governance frameworks and practices as a foundation to defining data governance models (Khatri & Brown, 2010; Tallon et al., 2013; Weber et al., 2009). However Kooper et al. (2011) warned against this approach, as they argued that it renders data governance vulnerable to the perceived limitations of its predecessors, particularly IT governance, insofar as perception of incomplete implementations and bureaucratic nature are concerned; which are said to impede innovation and entrepreneurship. It is therefore worth exploring the nature and origins of these earlier forms of governance and their evolution to provide context for data governance.

2.2.1 Corporate Governance

Corporate governance was plunged into the spotlight during the financial crisis of 2007 and 2008 (Erkens, Hung & Matos, 2012; Gupta, Krishnamurti & Tourani-Rad, 2013) amidst allegations that weak corporate governance structures affected firm performance during the recession. It was at this time that extensive research was undertaken to establish whether a relationship existed between corporate governance and firm performance. This was based on an argument that the risk management and finance policies that were a result of trade-offs between associated costs and benefits made by corporate boards and shareholders were at the centre of the crisis (Erkens et

al., 2012). Kole and Lehn (1997) attributed this to the widespread literature which stipulated that firms with optimal governance structures survive in competitive markets. Therefore, by implication, what the financial crisis highlighted were apparent weaknesses in existing corporate governance structures.

According to Barton and Wiseman (2015), this can be attributed to a failure to appoint the right people with the necessary experience and skillsets to boards. They further emphasised the importance of spending quality time on strategy and long term investments as opposed to the traditional focus on short term returns for shareholders. Subramanian (2015) supported this argument and argued that corporate governance needs to return to these basic principles to ensure longevity and relevance of the organisations represented.

Kole and Lehn (1997), on the other hand, claimed that ineffective corporate governance is a result of an inability of organisations to adapt their governance structures in light of changes in the business environment and thus putting them at risk of extinction due to being out performed by more efficient firms. This highlights the evolutionary nature of corporate governance made explicit by regular reviews and updates to codes of corporate governance structures, such as the King Code of Governance for South Africa (IOD SA, 2009).

It is as a result of this evolution that following the recognition of the pervasive and integral role of IT in driving business strategy, the revised King III released in 2009 called for the governance of IT at board level as a corporate imperative from a growth and sustainability perspective (Ntim, 2013). This signified a shift in perceptions of IT as an enabler of business strategy to IT as an integral part of business strategy, with the exploitation of data assets for competitive advantage (Ferguson, Green, Vaswani & Wu, 2013). As such, Bharadwaj, El Sawy, Pavlou and Venkatraman (2013) argued that businesses should abandon the perception of an IT functional strategy that is subordinated to the business strategy, towards a fusion of IT and business strategy. For this reason the King III report addresses IT governance in detail for the first time and mandates governance of IT as a corporate imperative from a growth and sustainability stance (IOD SA, 2009).

2.2.2 IT Governance

Weill and Ross (2004) defined IT governance as roles and responsibilities as they relate to the allocation of decision making power and accountability for encouraging desirable behaviour in the use of IT to implement a business strategy. They further emphasised that it reflects on far-reaching corporate governance principles while still concentrating on the management and use of IT to accomplish corporate performance goals, and should therefore not be considered in isolation but rather linked to other key enterprise assets such as human, financial, intellectual resources. As a result and in support of this, Juiz and Toomey (2015) argued that IT governance is no longer optional, but is rather an imperative if a company is to remain competitive and avoid losing opportunities and potentially failing in this technology age.

The need for IT governance was further discussed by Mithas, Tafti, Bardhan and Goh (2012), who maintained that given that IT investment constitutes a large portion of discretionary expenditure in organisations, it is critical to justify the value add and governance of IT. In addition, the governance structure will provide the ability to prove a direct correlation between IT investment and profitability, which based on research yields greater returns than other flexible investments such as advertising and R&D (Drnevich & Croson, 2013). However, according to Ali and Green (2009), it is not just the presence of IT governance that will achieve these results, but also IT governance mechanisms such as IT steering committees and IT structures. They further elaborated that this is necessary as the cost-benefit debate is still applicable and therefore based on the IT intensive nature of the company and more broadly the industry within which it operates, different strategies for IT governance can be adopted.

Furthermore, and with reference to the evolutionary nature of governance, Andriole (2015) highlighted the progression of IT governance from the previously centralised management approach which focused heavily on standards, towards the current federated, participatory model. Yet another aspect of the evolution of IT governance, according to Khatri and Brown (2010), is the traditional focus on practices and standards pertaining to IT structures such as software applications and infrastructure as opposed to the actual data, which is a critical decision making aspect of business strategy. This has led most organisations to manage their data in the context of system applications within which they reside, as opposed to recognising data as a strategic

asset (Panian, 2010). As a result, the current research suggests a shift from IT governance which focuses on systems towards the more focused and intentional governance of data (Hagmann, 2013; Khatri & Brown, 2010; Tallon et al., 2013).

This renewed focus is aligned to research by Shanks (1997), which alluded to the need for an enterprise wide data strategy to combat cross functional deficiencies, which were leading to an inability to respond to the strategic questions that were critical the competitiveness of an organisations. As such, data in and of itself is now widely recognised as a strategic asset to be governed (Tallon et al., 2013). To this end, Korhonen, Melleri, Hiekkanen and Helenius (2014) argued that both corporate and IT governance failed to portray the business value of data, hence the need for a focused data governance undertaking.

2.2.3 Data Governance

Unlike previous research done in this field, and building on a model by Weill and Ross (2004) which identified key organisational assets that need to be governed, Khatri and Brown (2010) drew attention to the importance of making a distinction between data and physical IT assets. This deliberate division highlighted the need to establish frameworks and models pertaining to data governance independent of IT governance, to ensure that data can be leveraged to add business value.

Whilst extensive research has been done on IT governance, data governance is still in its infancy and was first presented by Donaldson and Walker (2004) as a supporting framework to manage data assets for the National Health Society (Kooper et al., 2011; Weill & Ross, 2004). To address this concern, Tallon et al. (2013) and Weber et al. (2009) discussed the importance of not just defining components that constitute data governance, but also ensuring that the resultant framework identifies factors that enable and inhibit data governance implementation; assigns roles and responsibilities to establish accountability for the delivery of various components; and defines the objectives an organisation plans to achieve through such an implementation. Even more critical, they suggest that these objectives are to be linked to the strategy.

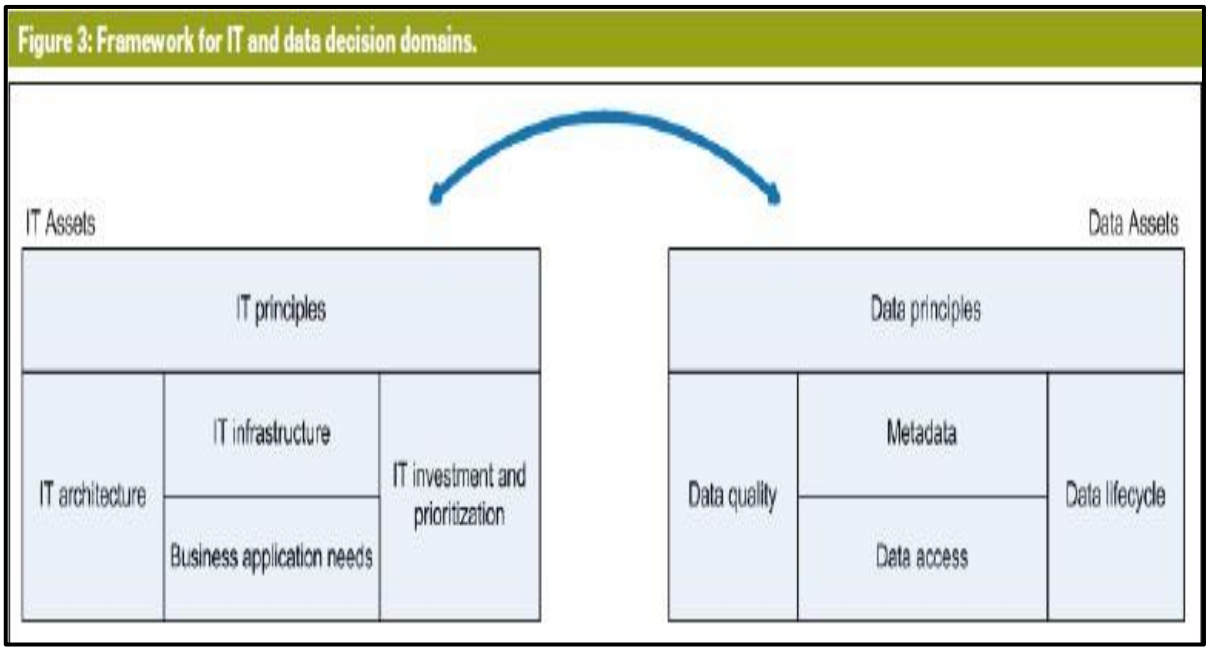
Based on this holistic approach to data governance, existing definitions for data governance focus less on its components and more on assigning responsibility and accountability to business and IT for the management and decision making power in

defining policies and executing governance strategy over data assets (Khatri & Brown, 2010; Otto, 2011; Weber et al., 2009). However, developed frameworks address issues pertaining to contingencies, objectives and accountability as they relate to data governance components.

2.3 Data Governance Components

In an early attempt to formulate a data governance framework, Khatri and Brown (2010) drew a parallel and translated the IT decision domains identified by Weill and Ross (2004) to derive data decision domains as depicted in Figure 1 below.

Figure 1: IT and Data Decision Domains



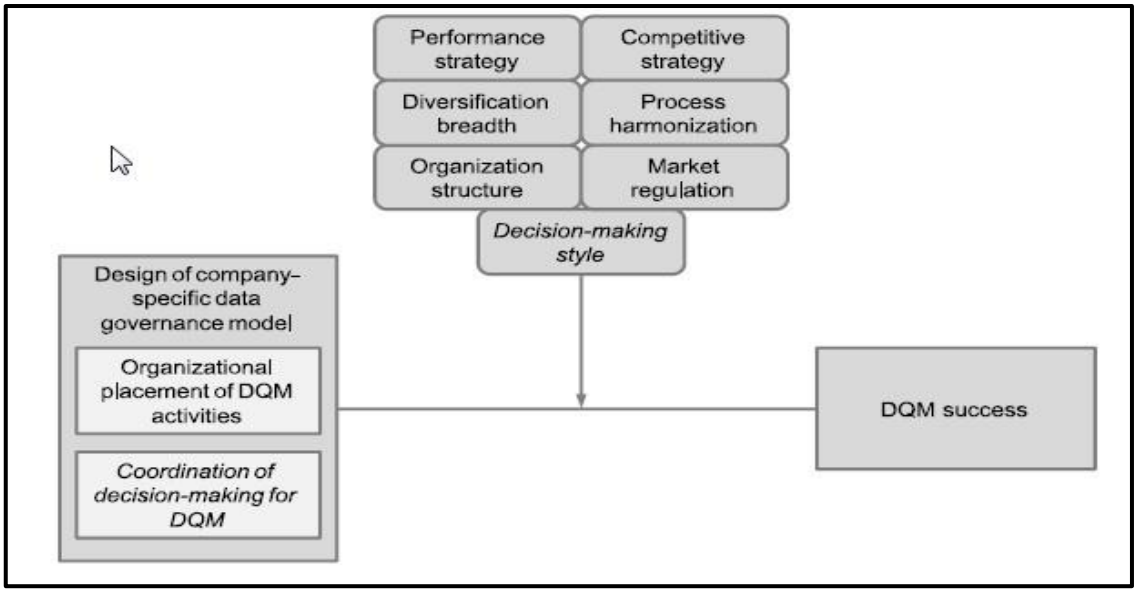
Source: Khatri and Brown (2010, p. 150)

While extensive prior research on each of these data management domains existed separately, especially on data quality (Wang, 1998; Weber et al., 2009).), an integrated view that formed a basis for data governance as well as organisational context was missing (Weber et al., 2009). For this reason, Khatri and Brown (2010) endeavoured to establish a link between these data domains and well known IT domains as a starting point, and furthermore provided guidelines pertaining to the roles and responsibilities for addressing the decision questions that are relevant to each of these domains. This was an attempt to present a holistic concept of data governance in order to provide a platform for organisations to determine and evaluate how this concept fits within their

current governance structure and strategy. Furthermore, Khatri and Brown (2010) emphasised the importance of associating potential roles which will ultimately determine the locus of accountability for data governance for each of the data decision domains. Kooper et al. (2011), Panian (2010) and Weber et al. (2009) all agreed with this approach, especially the emphasis on assigning accountability for data decision management within an organisation.

Weber et al. (2009), however, had earlier introduced an extended integrated framework and approach to data governance, albeit limited to the data quality domain context. This framework, as depicted in Figure 2 below, highlighted the interaction between organisational structures and specific contingencies that could either be internal and external to the organisation that affect the chosen data governance design success. This model is based on Donaldson's (2001) work, which specified that the relationship between certain characteristics of an organisation and its effectiveness is determined by a set of contingencies in the internal and external environment.

Figure 2: Data Governance Contingency Model

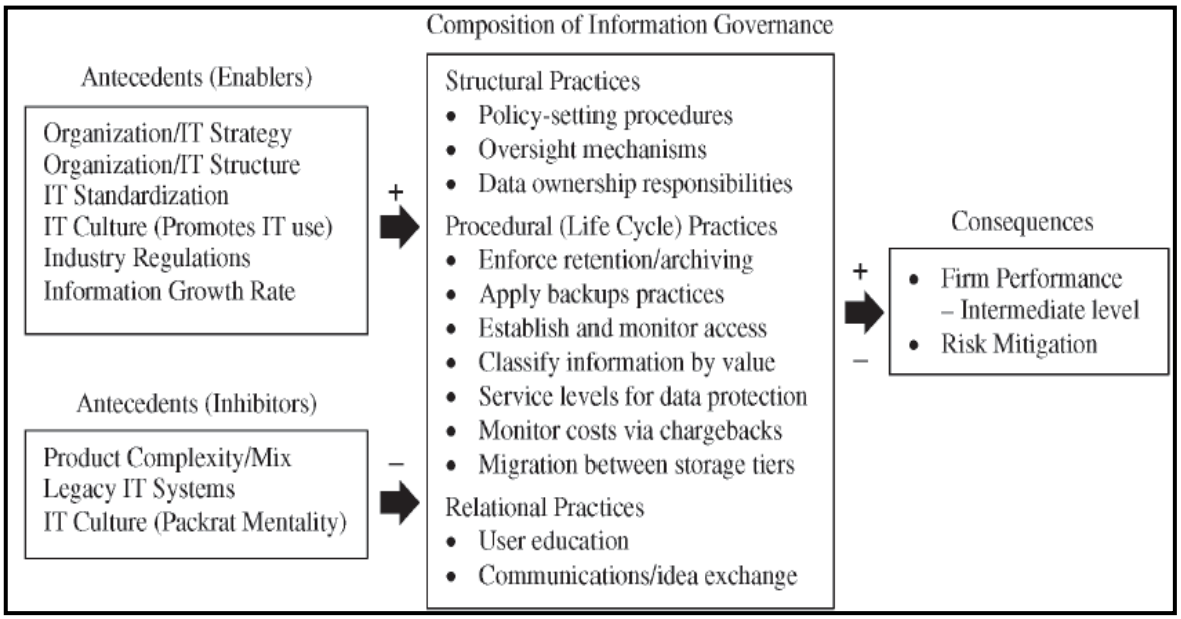


Source: Weber et al. (2009, p. 17)

Although Weber et al. (2009) stated these contingencies generically, Tallon et al. (2013) further divided them into enablers and inhibitors to emphasise how each contingency affected the chosen data governance design.

Figure 3 below depicts the proposed categorisation of contingencies and further hypothesised that the impact of data governance on firm performance and risk mitigation is dependent on whether the enabling or inhibiting contingencies are more dominant (Tallon et al.,2013).

Figure 3: Information Governance Model



Source: Tallon, Ramirez and Short (2013)

It is on the foundation of these frameworks, especially the latest one by Tallon et al. (2013) that the remainder of this chapter further explores the components, objectives, accountability, enablers and inhibitors of data governance in literature.

These models clearly indicate the evolutionary and exploratory state of data governance and its constituents and as a result the research seeks to determine the following:

Research Question 1: What are the components of data governance?

2.4 Data Governance Objectives

Panian (2010) discussed the need for compelling business drivers to execute data governance. He suggested that the appropriate management of data will unlock an competitive advantage, drive down costs and help meet customers' needs. Tallon et al. (2013) also identified improved firm performance and risk mitigation as outcomes of

data governance. It can therefore be argued that these characteristics represent the aspirational objectives by organisations when designing and executing data governance.

2.4.1 Data: A Strategic Asset

According to Korhonen et al. (2014), the real business value add of any data governance initiative is to promote data as a valuable enterprise asset within an organisation. This was supported by Khatri and Brown (2010), Kooper et al. (2011), Otto (2011) and Panian (2010), all of whom suggested that data is a strategic asset with the potential to unlock competitive advantage within a well-defined and executed data governance framework.

Yet Panian (2010) alluded to a tension between governance procedures and innovation capabilities in organisations, which can also be a source of competitive advantage. In an attempt to address this paradox, Tallon and Pinsonneault (2011) described a need to ensure alignment between all strategic drivers, such as innovation, financial performance and IT. Furthermore, Panian (2010) highlighted that the ability to leverage this strategic asset requires the integration of data assets across multiple applications and business processes, as opposed to the previously standalone application-based view. To achieve this, Korhonen et al. (2014) advocated for strategic steering driven from the top and aligned to corporate objectives and policies to ensure a holistic view and implementation of data governance by at other levels of the organisation.

Nevertheless, there is a lack of evidence in literature as to whether this alignment and integration has been achieved from a data governance perspective. Khatri and Brown (2010) suggest that this paradox can be resolved by demarcating the business use of data assets; an objective that can only be achieved through the identification of the business data owners.

2.4.2 Firm Performance

Khatri and Brown (2010), Kooper et al. (2011) and Tallon et al. (2013) suggested an association between data governance and organisational performance. However, according to Tallon et al. (2013), the scale of this effect has not been determined,

especially at a strategic level. This is attributed to the subjective nature inherent in data as an intangible asset, which renders it difficult to measure and thus presents challenges from an accounting perspective (El-Tawy & Abdel-Kader, 2012).

In an attempt to establish the link between data governance execution and firm performance, Korhonen et al. (2014) instantiate an organisation-wide agile data model that focuses on two aspects of performance - effectiveness and efficiency. In doing so, they provided a framework that enables a business to use data governance to drive these key performance indicators.

McAfee and Brynjolfsson (2012) elaborated on current key data trends such as big data, analytics and digitisation. Their research showed that a correlation exists between data driven companies and their performance.

As a result, the ability to demonstrate how firm performance can be improved through a properly executed data governance strategy forms the basis for future research in this field.

2.4.3 Risk Mitigation

The recent overhaul of financial services regulations has caused an increased focus on risk mitigation related to data (Pytlik & Myers, 2010). It is against this backdrop that Tallon et al. (2013) recommended data governance as a solution to mitigate data-related security issues. Similarly, Khatri and Brown (2010) submitted that compliance legislation such as SOX and Basel II are crucial drivers in how organisations govern their data, from inception to storage or deletion.

These observations support von Solms and von Solms (2005) findings, which concluded that information security is broader than just the protection of data and information assets, but could lead to business and legal consequences.

2.4.4 Cost Reduction

Regulatory enforcement practices have led to huge costs for organisations in recent years (Pytlik & Myers, 2010). Similar costs are associated with an inability to achieve a

single view of a customer and thus organisations are failing to cross sell products due to insufficient and disparate data pertaining to clients (Li, Sun & Montgomery, 2011). Khatri and Brown (2010) further highlighted the costs associated with poor data quality and propagation of multiple systems simply because organisations did not understand what data is currently used and more specifically in which systems it is currently stored.

For these reasons, Tallon et al. (2013) suggested the remediation of such costs through data governance. It is therefore warranted to seek to determine what stakeholder perceptions on the objectives of data governance as this will arguably determine its strategic placement.

Research Question 2: What are the objectives of data governance?

2.5 Data Governance Roles

The strong links associated to decision making rights and accountability in relation to defining data governance are indicative of the criticality in ensuring that there are clearly defined roles against which appropriate responsibility can be assigned (Khatri and Brown ,2010); Kooper et al., 2011; Panian, 2010; Weber et al., 2009). As such, this warrants further exploration of identified roles in relation to data governance execution.

2.5.1 Key Roles

Figure 4 below depicts the key data governance roles identified by Khatri and Brown, (2010) as they related to the data management domains for whichs controls and standards should be instituted.

Based on the figure, data owners are proposed to form an integral part atleast from an accountability perspecitve in multiple data domains. This suggests the criticality of this role in data governance execution. However, according to Jonker and Petković (2014), whilst data ownership is one of the most important concepts in data management and specifically data governance, there is still no definitive methodology to enforce it within organisations as data owners can still not deliver data into repositories . As a result, it is therefore worthwhile to explore the uptake of this role in organisations (Kwon, Lee & Shin, 2014).

Figure 4: Data Governance Roles and Accountability

Table 1: Framework for data decision domains.

Data Governance Domains	Domain Decisions	Potential Roles or Locus of Accountability
Data Principles • Clarifying the role of data as an asset	• What are the uses of data for the business? • What are the mechanisms for communicating business uses of data on an ongoing basis? • What are the desirable behaviors for employing data as assets? • How are opportunities for sharing and reuse of data identified? • How does the regulatory environment influence the business uses of data?	• Data owner/trustee • Data custodian • Data steward • Data producer/supplier • Data consumer • Enterprise Data Committee/ Council
Data Quality • Establishing the requirements of intended use of data	• What are the standards for data quality with respect to accuracy, timeliness, completeness and credibility? • What is the program for establishing and communicating data quality? • How will data quality as well as the associated program be evaluated?	• Data owner • Subject matter expert • Data quality manager • Data quality analyst
Metadata • Establishing the semantics or "content" of data so that it is interpretable by the users	• What is the program for documenting the semantics of data? • How will data be consistently defined and modeled so that it is interpretable? • What is the plan to keep different types of metadata up-to-date?	• Enterprise data architect • Enterprise data modeler • Data modeling engineer • Data architect • Enterprise Architecture Committee
Data Access • Specifying access requirements of data	• What is the business value of data? • How will risk assessment be conducted on an ongoing basis? • How will assessment results be integrated with the overall compliance monitoring efforts? • What are data access standards and procedures? • What is the program for periodic monitoring and audit for compliance? • How is security awareness and education disseminated? • What is the program for backup and recovery?	• Data owner • Data beneficiary • Chief information security officer • Data security officer • Technical security analyst • Enterprise Architecture Development Committee
Data Lifecycle • Determining the definition, production, retention and retirement of data	• How is data inventoried? • What is the program for data definition, production, retention, and retirement for different types of data? • How do the compliance issues related to legislation affect data retention and archiving?	• Enterprise data architect • Information chain manager

Source: Khatri and Brown (2010, p. 149)

In their depiction of key data governance roles, Khatri Brown (2010) refer to data stewards who are responsible for remediating any data quality issues as defined in set data governance standards. This role is deemed critical and central to the application of the standards which are typically set by a committee responsible for constituting data governance (Weber et al., 2009).

Furthermore, despite being data quality focused, Weber et al. (2009) highlight the need for a sponsor who should be a senior person within the organisation to steer data governance initiatives. According to Wende and Otto (2007), this role is responsible for setting strategic direction, funding, oversight and advocacy for data governance.

2.5.2 Emergent Roles

The introduction of technology to organisations brought to light the need to govern IT in order to realise its benefits, which in turn led to the emergence of the position of Chief Information Officer (CIO) (Juiz & Toomey, 2015). Gupta (1991) equated the proliferation of this role to that of the Chief Financial Officer, which facilitated the transition of accounting from a back office function to a weapon for competitive advantage.

Despite the implied role based on the naming especially of the CIO; with emphasis on information, traditionally and over time it became apparent that this role primarily focused on the technology stack as opposed to the information or data (Andriole, 2015; Hagmann, 2013). This perception presented challenges even in the early stages of this role. Gupta's (1991) research revealed that most Chief Executive Officers (CEOs) felt that there was a disconnect between their expectation of the value add potential of data and the reality, as there was a lack of alignment to business objectives.

It therefore became apparent that there was a huge divide between the language and viewpoint of traditional CIOs, who tended to be more technically versed in the boardroom, and those of the more business-oriented executives (Peppard, 2010). This fostered a culture that perceived data to be the responsibility of the IT department, to be stored with minimal consideration for its business value add potential (Ebbage, 2014). These findings concurred with those of Panian (2010), who cited a lack of a concrete data governance structure defining an ownership model for data similar to that of applications and software in organisations.

Despite the prevalence and understanding for the need of key data focused roles such as data architects and data stewards, the lack of a data focused individual who had a combination of business and technical backgrounds meant that most organisations were not in a position to formulate strategies that would see them leverage the benefits of governed data (Ebbage, 2014). As data gained popularity in business, it became clear that the CIO role was skewed towards a focus on technology as opposed to data (Andriole, 2015). This was due to the fact that this position was mainly held by individuals who had a technical background and lacked the business context associated with the data they sought to store (Juiz & Toomey, 2015). As a result,

Ebbage (2014) suggests the emergent Chief Data Officer (CDO) as being responsible for supervision of projects geared towards deriving value from enterprise data. She further states that this individual should have a mix of business and technical skills in order to effectively drive data governance.

In their recent work, Korhonen et al. (2014) found that the data governance roles identified in the literature are not all encompassing, especially when seeking an organisation-wide allocation of such roles. To this end, their work arguments on roles in literature by identifying other pivotal roles, as well as recognising an additional data governance committee to drive organisation-wide execution. This view supports a previous attempt by Khatri and Brown (2010) to identify roles and the locus of accountability within each data governance component.

While several roles are mentioned in the literature, each bearing slight variations in the name and list of responsibilities, there is consistency in the recognition that identifying a business owner for data assets is key to data governance execution (Ebbage, 2014; Khatri & Brown, 2010; Tallon et al., 2013). Furthermore, given that this literature seems to imply that data governance is still mainly driven by IT, there seems to be a misalignment in terms of who should champion this agenda to ensure that the business is able to unlock data as a strategic asset for competitive advantage (Ebbage, 2014).

Research Question 3: What key roles are essential for data governance?

2.6 Data Governance Accountability

Khatri and Brown (2010) stated that central to data governance design is decision making, and more importantly, identifying those responsible and ultimately accountable for data governance in the organisation. Kooper et al. (2011) and Weber et al. (2009) supported this view, as the roles and loci of decision making power are entrenched in their definition of data governance. To this end, Weber et al. (2009) defined data governance as comprising of roles, decision areas and responsibility assignment.

An initial allocation of roles and locus of accountability as presented by Khatri and Brown (2010) was presented in Figure 4 above. Their model highlights the prominent role data owners play in each of the identified domains and as such could be

considered a key role.

Furthermore, Korhonen et al. (2014) described the important role that data governance plays in ensuring that people are allocated accountability for data management and are given the authority to make decisions, and to ensure that these objectives are linked to their performance reviews and incentives.

Hagmann (2013) strongly advocated that the locus of control of data governance accountability and responsibility be located in business as opposed to IT. This view was previously suggested by Otto (2011) and Weber et al. (2009), who highlighted the failures associated with data governance execution driven by IT. Despite such evidence, research conducted by Otto (2011) highlighted that data governance accountability is still located in IT as the ultimate responsibility resides with the CIO, which as previously discussed is predominately a technology focused role. Whilst Hagmann (2013) also advocated for the elevation of data governance accountability to the C-suite level, a further argument has been made to extend this to other executives, including the Chief Risk Officer (CRO).

Kooper et al. (2011), however, suggested a three-pronged responsibility approach, as they identified creators, consumers and governing actors who each need to be accountable for their delivery of a holistic data governance model. It is based on this view that they further highlighted the subjectivity in recognising the value of data and hence the need to advance a deeper understanding of what drives decision making control allocation for data governance in organisations.

Research Question 4: Who is ultimately responsible and accountable for data governance?

2.7 Factors that Enable Data Governance

The ability to execute a data governance strategy within organisations requires the enhancement of specific drivers that enable data governance to achieve the stated objectives (Tallon et al., 2013; Weber et al., 2009). Tallon et al. (2013) further argued that the degree to which these enabling factors are dominant will lead to data governance implementation success.

2.7.1 Information Growth Rate

The prolific growth rate of data available to organisations has given rise to new concepts such as big data, as data are now recognised more as a strategic driver towards increased competitive advantage (McAfee & Brynjolfsson, 2012). For this reason, Tallon et al. (2013) identified data growth as a data governance initiative trigger in organisations, and as such an enabler. However, Malik (2013) warned that one should not underestimate the challenges posed by high data volumes on data governance programmes. This paradox highlights the dual role of the rapid growth rate of data in organisations in terms of its effect on data governance execution.

2.7.1.1 Data Related Business Trends

This rapid growth rate has led to data related trends such as big data, analytics and digitisation which are changing how organisations do business (McAfee & Brynjolfsson, 2012). Additionally Mayer-Schönberger & Cukier (2013) stated that in 2013, more than 98 percent of all data stored world wide was digital, thus further higlighting the data depencency that digitisation brings.

In relation to these data trends, Wamba, Akter, Edwards, Chopin & Gnanzou (2015) argued that veracity, which addresses the need to ensure data quality should be emphasised. They further stipulated that this was important as one in three business leaders did not trust the data they used in decision making. As such alluding to the previously stated key data governance objective related to quality control. Adding to that McNeely & Hahm (2014) warn that big data has given rise to new challenges in analytics that have led to debates on the governance and policies that should be applicable. Thus warrants further probing as to whether information growth and the related emergent data trends complicate the data governance task.

2.7.2 Organisation Strategy

Bharadwaj et al. (2013) argued for a re-evaluation of the functional level positioning of an IT strategy in support of a business strategy to a fusion of both, in line with creating what they termed a digital business strategy. Hagmann (2013) further argued in favour of shifting data governance from IT to business to ensure that adequate attention is

given at the executive. Bhansali (2013) suggested that such a transition would bridge the current gap between business and IT and ensure strategy alignment, as opposed to the biased affiliation synonymous with an IT strategy towards technology and infrastructure as opposed to actual data.

This indicates a need to re-evaluate the role of data and specifically its governance in an attempt to achieve synergy between organisational and IT strategies, which has been an challenge (Drnevich & Croson, 2013). It can therefore be argued that through repositioning to achieve alignment between a business and an IT strategy, data governance can achieve its anticipated objectives.

2.7.3 Organisation Structure

According to Weber et al. (2009), organisational structure is a contingency factor of data governance. They viewed the degree of centralisation verses decentralisation as one determinant of the chosen data governance framework policy. Otto (2011) reinforced this opinion and proposed that organisational structure is crucial in determining who has data governance decision making rights.

Additionally, Weber et al. (2009) found that a trade-off is required between the two organisational structures in so far as decision making is concerned, which has led to more complex forms such as federated organisational structures. They further suggested that the chosen structure will also determine data governance execution, hence their warning against prescribing a single data governance framework for all. A research case study of two telecommunications companies by Otto (2011) confirmed that despite being in the same industry, each company had managed to achieve their data governance goals despite differing structures and decision making controls.

On the other hand, Tallon (2013) implied a clear distinction in organisational structure and hypothesised that a centralised organisational structure acts as a data governance enabler, while a decentralised structure would inhibit such policy execution. Moreover, Korhonen et al. (2014) seemed to suggest and advocate for a model that would see data governance accountability represented at every level of the organisation. This is based on their view that data governance is an organisation-wide approach to data and therefore there should be a level of accountability and decision making at a strategic

level all the way to the operational day-to-day interactions within the organisation.

2.7.4 Industry Regulation

According to Pytlik and Myers (2010), compliance is a critical component of enterprise risk management. This is as a result of the global financial crisis which has led to regulators mandating requirements to institute data governance solutions (Delbaere, 2007). Weber et al. (2009) also highlighted that data of good quality which can be accomplished through data governance is a pre-requisite to meeting global presence demands, as it entails a focus on the integration of data to ensure regulatory compliance across which is further complicated by geographic dispersion.

Research undertaken by Becher and Frye (2011) supported this notion as they found that industry regulation and governance complement each other. However, they also suggested a threshold on the degree of synergy due to the costs involved in instituting a monitoring activity associated with governance. Tallon (2013) alluded to a similar tension when he highlighted the importance of data governance policies that strike a balance between adequate and affordable risk. The key question arising from the literature is therefore the extent to which industry regulation can be considered a data governance enabler as opposed to a costly exercise.

The framework presented by Tallon et al. (2013) suggests a clear allocation of the factors discussed above as enablers. However, as per the other literature discussed, it is uncertain whether such a distinct separation is warranted and thus poses the following research question:

Research Question 5: What internal and external factors enable data governance?

2.8 Factors that Inhibit Data Governance

The opposing factors to the enablers mentioned above create a tension for data governance execution and therefore warrant further investigation, as their dominance is associated with a failure to achieve data governance objectives (Tallon et al., 2013).

2.8.1 Legacy Systems

According to Murtaza (1998), legacy systems are replete with valuable data that is never capitalised upon. Similarly, Madni and Sievers (2014) suggested that legacy systems represent a key organisational asset due to the data that are accumulated and stored over time. Despite this, Khatri and Brown (2010) believed that most organisations do not know all the data they have or the sources of the critical data that they need to make business decisions.

Furthermore, Murtaza (1998) also highlighted that data quality and integrity issues are synonymous with legacy systems data, and hence advocated a move towards more heterogeneous data warehousing in an effort to clean the data. Thus, despite the recognition of a mission critical need for legacy systems, the complexity in their integration presents a challenge for data governance efforts (Tallon et al., 2013). This was also highlighted by Madni and Sievers (2014), who pointed out the organisational system integration challenges presented by legacy systems which have adverse risk implications.

2.8.2 Product Complexity

Taisch, Cammarino and Cassina (2011) suggest that as a result of the competitive nature of current markets, companies are forced to focus on product development and ensure efficiencies while also ensuring that they adhere to quality standards. According to Weber at el. (2009) this is increasingly an issue due to globalisation which introduced the need to harmonise business processes across continents amidst customer requirements for individualised products.

Furthermore, changing customer demands towards more integrated and personalised product and service solutions have added complexity not only to the production and supply chains in organisations, but also to managing the data associated with each product derivative (Nordin, Lindahl & Brege, 2013). Tallon (2013) reasoned that this complexity, especially in multi-divisional organisations, results in a lack of synergy of efforts in data governance. To this end, Taisch (2011) indicate lack of an existing data model to proficient enough to cater for data across the entire product lifecycle.

Yet Otto (2011) and Weber et al. (2009) argued that organisational structure and divisions of this nature simply allude to a need to adopt a fit for purpose and design data governance framework, and therefore seem to imply that a strict view of product complexity as it pertains to data governance is not founded.

2.8.3 Organisational Culture

Hofstede (1989) defined culture as the shared conditioning of the mind which differentiates members of one grouping of people to another. He further highlighted how pervasive culture had become suggesting that managers could no longer avoid its influence in their organisations.

According to Hofstede (1989) there are subcultures which are usually associated with each business unit within an organisation which further complicates the organisational culture discourse. One such culture which prevails in the data governance discussion is IT culture Hagmann (2013).

Drnevich and Croson (2013), Hagmann (2013) and Kooper et al. (2011) expressed some organisational views that an IT culture was synonymous with a lack of delivery. For this reason, Hagmann (2013) advocated for a disassociation of data governance from IT governance, which is driven by audit and control limitations. Drnevich and Croson (2013), on the other hand, suggested a holistic view of IT as not just a functional unit but as an integral part of business strategy. They therefore suggested that through such elevation, the current IT culture can be transformed as it will receive more visible support from top management.

Tallon et al. (2013) and Weber et al. (2009) suggested that the negative view of IT and the current perception that data governance is a function of IT act as barriers in the execution of data governance. It is for this reason that Tallon (2013) advocated for not just a change in IT culture, but for a corporate-wide culture that promotes the strategic use of IT. Otto (2011) discovered similar challenges in his research as it was evident that if data governance was not entrenched into the culture of an organisation, it acts as a barrier to the execution of any data governance framework.

According to McAfee and Brynjolfsson (2012), the ability to leverage data as a strategic asset requires a cultural shift towards being a data driven organisation. However,

diagnosing and changing culture is not an easy task for any organisation as it involves determining how deep rooted the share values and assumptions currently go (Cummings and Worley, 2015). Will (2015) suggested the use of incentives to drive the cultural change as they would result in a win-win situation for the organisation and employees. While Cummings and Worley (2015) strongly suggest that top management should lead cultural change exercises.

Similarly to the previous section which discussed data governance enablers based on the model by Tallon et al. (2013), there is a clear debate in literature regarding the classification of factors as data governance inhibitors which therefore warrants the following research question:

Research Question 6: What internal and external factors inhibit data governance?

2.9 Conclusion

The literature review highlighted that whilst there is consensus on the need for data governance, there is also a need to determine whether a singular fit for purpose framework can be developed to assist organisations (Khatri & Brown, 2010; Tallon et al., 2013;). The ability to achieve this requires a clear understanding of the constructs that make up data governance as well as clearly set out objectives aligned to strategy (Weber et al., 2009.

Furthermore, the decision making rights for data governance have a significant impact on the success of such an initiative (Khatri & Brown, 2010; Kooper et al., 2011; Tallon, 2013). While the literature seems to suggest a dual line of responsibility and accountability for data governance between business and IT, the degree to which this is practiced in reality and the reasons for a lack of adequately established loci of control require further research.

Lastly, it is important to determine internal and external contingencies that affect design and execution of data governance (Hagmann, 2013; Weber et al., 2009). The subsequent effect of these contingencies will either enable or inhibit data governance, and as a result it is apparent that there is a need to investigate further how these

contingencies relate to data governance and whether a distinct classification of these factors as enablers or inhibitors is valid (Tallon et al., 2013; Weber et al., 2009).

3. Research Questions

This chapter restates the research questions formulated in the previous chapter which the author seeks to answer. These are based on the literature reviewed and the identified constructs pertaining to data governance components and objectives. The author pursues to determine vital roles within an organisation to establish data governance and who should be responsible and accountable for data governance.

Finally the author seeks to determine stakeholder views on the classification of internal and external data governance contingencies as either enablers or inhibitors of data governance depends on the organisational culture and strategic objectives.

The author therefore strives to answer the following research questions in this report:

1. **What are the components of data governance?** - The infancy of data governance has resulted in multiple academic framework interpretations depicting what constitutes data governance. This therefore warrants a need to determine stakeholder views on the components of data governance. The basis of this research question is based on the literature discussed in sections 2.2 and 2.3 which explore the history of data governance and current frameworks exploring components of data governance.

2. **What are the objectives of data governance?** - It is important to establish data governance objectives and ensure that from an organisational perspective everyone is aligned on what they are. In this way, the business case and value add by data governance can fully be entrenched and aligned to the business strategy as alluded to in section 2.4 of the literature.

3. **What key roles are essential for data governance?** – The prevalence of data and the governance thereof has led to the introduction of several roles that specifically cater for and mandate the agenda for data governance. It is however unclear from literature as discussed in section 2.5.1 whether these additional roles are warranted. This question seeks to determine the validity of these roles.

4. **Who is ultimately responsible and accountable for data governance?** –

The ability to execute on any identified strategic objective in an organisation hinges on the identification of the locus of control and accountability for the execution of set objectives as identified in section 2.5.2 of the literature. As such, this question seeks to determine where the locus of control and accountability for data governance resides.

5. **What internal and external factors enable data governance?** – According to Tallon et al. (2013), a distinction can be made between contingencies that facilitate implementation of data governance within an organisation. However, based on the literature as discussed in section 2.6, it is unclear whether a definitive distinction can be made on these factors. This therefore warrants a need to explore further views on what the perceived enablers of data governance would be within an organisation. Additionally, also to determine whether these could differ depending on an organisational structure and culture which would then support the generic view introduced by Weber et al. (2009).

6. **What internal and external factors inhibit data governance?** - Similarly to research question 5, research question 6 seeks to explore contingencies that are perceived to inhibit data governance within an organisation and determine whether a clear distinction can be made accordingly.

4. Research Methodology

4.1 Choice of Methodology

As research into data governance is still in its infancy (Hagmann, 2013), the ability to gain further exploratory insights and an in-depth understanding of how associated contingencies affect stated data governance objectives is imperative. Leedy and Ormrod (2005) and Saunders and Lewis (2012) concurred that an exploratory qualitative design approach is appropriate when the research problem and objectives aim to unearth further insights into a relatively new field of study.

Furthermore, Lee (1999) referred to Creswell's work in which a clear distinction was made between qualitative and quantitative research insofar as ontological assumptions are concerned, wherein qualitative research advocates for multiple subjectively derived realities that can coexist. This further supported the use of qualitative research given the existing literature on data governance, which alluded to various approaches to its implementation dependent on contingencies (Kooper et al., 2011; Weber et al., 2009). Therefore, in line with the stated research objectives, an exploratory qualitative methodology was employed to understand banking industry stakeholder perceptions, viewpoints and considerations of the nature of the subject, as suggested by Leedy and Ormrod (2005).

Leedy and Ormrod (2005) advocated for a thorough evaluation of existing research and theories related to the chosen topic of interest to aid critical thinking and form a basis for argument. This research approach is referred to as deductive and aims to test existing theory (Saunders & Lewis, 2012). Whilst some frameworks exist for data governance, they varied in terms of the considered composition of this phenomenon and the impact of different contingencies, as indicated in the literature. Therefore deduction was the initial basis for this research in order to critically evaluate the current theories. It was, however, anticipated that the data collection process would lead to alternative observations within the chosen population sample, specifically in defining the roles, responsibilities, enablers and inhibitors of data governance. Leedy and Ormrod (2005) and Saunders and Lewis (2012) both referred to this as an inductive research approach. For this reason, both research approaches were used.

4.2 Population and Unit of Analysis

Kooper et al. (2011) suggested that accountability for data governance should be bestowed on three groups within an organisations, namely: creators of data who they reference as IT people responsible for ensuring that data can be made available throughout the company where needed, consumers of data are both the end users that might have captured data into systems as well as other stakeholders depended on data produced elsewhere to make decisions, lastly data governance personal who are subject matter experts in the area. Thus based on this, the chosen population comprised of the following groups

- Data governance practitioners and experts in the banking industry.
- Data consumers in the banking industry.
- Data creators in the banking industry
- Data governance consultants with vast consulting experience and specialization in the banking sector

The rationale for extending the population of relevance outside banking employees was to address the inherent bias associated with qualitative research on the part of the researcher and respondents as it pertained to an industry within which they operate (Leedy & Ormrod, 2005). This approach allowed for a broader and more robust perspective of data governance as it pertains to banks in South Africa, as it incorporated the views of practitioners and experts who are closely affiliated with data governance within the context of banking in South Africa.

However, the primary population of interest was data governance practitioners and experts in the banking industry; supplemented by the consultancy group which was felt to have the necessary knowledge and insight on the subject. Data consumers and creators were introduced for the purposes of triangulation. Denzin (1978) defined triangulation as the use of a mixture of methods to study the same phenomenon. According to Blaikie (1991) the aim of triangulation is to address the inherent bias associated with the use of a single lense in research as well as the ability to validate findings. Therefore the researcher used triangulation of the identified groups above to verify and increase the level of confidence in the findings.

The unit of analysis was the knowledge and perceptions of individuals operating within

the banking industry in South Africa with data governance experience or daily use of data to make decisions. Thus the unit of analysis was in line with the stated research objectives, and the qualitative approach was used to to ascertain the perspectives and viewpoints of the identified groups of the population.

4.2.1 Sampling Method and Size

Marshall, Cardon, Poddar and Fontenot (2013) argued that apart from choosing the research topic, the acquisition of an appropriate sample is an integral component of credible research. Furthermore, Leedy and Ormrod (2005) suggested that the chosen sample should be dependent on the research questions and methodology. Given the qualitative nature of the research, a two layered sampling technique was used, encompassing:

- non-probability purposive sampling, which is commonly used within this category (Saunders & Lewis, 2012). The intention of this sampling approach was to select individuals who were most likely to yield the most data governance in the banking sector (Leedy & Ormrod, 2005). Within this,

- a non-probability quota sampling was applied to ensure representation from all three identified groups of the population (Saunders & Lewis, 2012). It is further noted that banking employees constituted a greater majority of the sample as they represent the population of relevance.

Marshall et al. (2013) alluded to the ambiguity that is rife in qualitative research pertaining to defining sampling size standards. Sandelowski (1995) supported this view and further elaborated that whilst it might be difficult to determine appropriate sample sizes in qualitative research, it is incumbent on the researcher to ensure that the chosen number provides sufficient content relevant to the research topic and that all identified characteristics of the population are represented. Marshall et al. (2013) and Saunders and Lewis (2012) warned against over extending the sample size as well as the importance of understanding saturation, wherein no further insights can be solicited from additional members of each group.

A total sample of eleven respondents was interviewed. The following sample size per

population group was thus deemed to suffice for the purposes of this research:

- Data governance practitioners and experts in the banking industry: A sample of three subject matter experts (SME) was chosen from this population. As the primary group with extensive knowledge in data governance, it was deemed appropriate that they represent the majority of the sample
- Data consumers in the banking industry: A sample of three data consumers was chosen to provide an alternative view on the state of data governance in the banking industry and for the purposes of triangulation
- Data creators in the banking industry: A sample of three data creators and was chosen to provide their perspective on the subject and for triangulation.
- Data governance consultants with vast consulting experience and specialisation in the banking section: Two representatives from this group were chosen to supplement the data governance expert group as it was assumed that they would have similar views with regards to data governance within the banking sector whilst also providing an outside perspective on the subject

4.3 Data Gathering Process and Measurement Instrument

Saunders and Lewis (2012) deemed semi-structured interviews to be an appropriate data collection approach and measurement instrument for qualitative research, which is why it was chosen as the source of data for the analysis for this research.

An initial interview question guide was compiled based on the literature reviewed and the research questions formulated in chapter 2 and restated in chapter 3 (See Appendix 1). According to Saunders and Lewis (2012), pilot interviews aid the research process by revealing whether the intended line of questions will direct the interviewee to provide insights the researcher seeks. As such, a pilot interview was conducted with a data consumer at one of the banks. Subsequent to this, it became apparent that additional guiding questions were required to get the depth of data required to gain meaningful results for analysis for the research questions. As a result the researcher updated the initial interview guide to incorporate questions that would ascertain the role of the interviewee to classify them according to the roles identified by Kooper et al. (2011) and their cultural perceptions of the bank within which they are based to set the context of their responses (see Appendix 2).

Prior to conducting the interview the interviewees were e-mailed the informed consent letter to provide context to the research (see Appendix 3). On receipt of the consent letter, some respondents felt they did not have sufficient knowledge of the subject to provide significant insights and thus chose not to participate. Whilst others opted not to participate as they would have preferred to complete an online questionnaire. This further highlights the sensitivity around qualitative research and validates that data governance is a fairly new area of research currently.

The interviews lasted on average 45 minutes. The interview process was guided by a set of themed questions, of which some were left out and additional questions added based on the direction and depth of insight the researcher ascertained during the interview. The research questions were not posed in the same order for all interviews as the order was purely reliant on the nature and direction of each specific interview.

Prior to the interview the respondent were promised that their identities would be protected. To achieve confidentially, the pseudo names were given to each respondent based on banking institution or consultancy they worked for; which were coded by assigning a number; for example (Bank 1, Bank 2) and the respondents were coded based on the group they belonged to as per Table 1 below. It is assumed that the promise to preserve their identities led to a much more robust discussion (Leedy & Ormrod, 2005).

Table 1: Respondent Coding

Group	Code
Data Governance Subject Matter Expert	SME
Data Consumer	DC
Data Creator	DCR
Consultants	CONS

4.4 Analysis Approach

Lee (1999) identified the main techniques for analysing qualitative data as comprising of sorting, organising and indexing data, while Leedy and Ormrod (2005) suggested categorising themes in order to aid reasoning as part of the analysis process, which is

inherently subjective and potentially biased as it is anchored on the researcher's interpretation.

Leahey (1980) defines deductive reasoning as the art of combining two disjoint processes through encoding of an argument as read and understood followed by a deductive inference which is drawn based on this link. As such, a deductive approach to data analysis was followed for this research based on key themes identified from literature (see Appendix 4) for the literature code book.

All interviews were recorded and the content thereof used to analyse the data. The recordings were given to a transcriber to transliterate into word format. Instances where the transcriber was not sure of the content or the recording was not audible were highlighted in the text. The researcher then went through each transcript for quality assurance and resolved any gaps identified based on the interviews.

The transcripts were then loaded in ATLAS.ti7; a computer-aided qualitative data analysis software (see Appendix 5) for a sample transcript. Once loaded each transcript was read again with the intention to identify emerging themes and classifying interview content based on identified themes based on the code book developed from literature. Themes identified outside of the literature code book we deemed to be a result of inductive analysis and thus marked accordingly to ensure that the insights are incorporated in the analysis and (Saunders & Lewis, 2012). This aided the analysis to determine similarities and insights.

The coding process and identification of themes were then used as a basis to present the results and further discuss them in light of the literature reviewed.

4.5 Research Limitations

Despite the recently achieved respectability of qualitative research in academia, its limitations were still relevant when it came to appropriately positioning this research and providing adequate context (Bailey, 2014). Firstly, exploratory qualitative research is subjective as it reflects the assumptions and interpretation of the researcher (Saunders & Lewis, 2012). In addition, given the limited sample size, the results of the

research cannot be generalised to the entire population (Marshall et al., 2013). Cost implications contributed to the small sample size (Saunders & Lewis, 2012).

The above limitations allude to biases which also posed further limitations:

- Researcher bias due to the subjective nature of qualitative research and associated analysis process.
- Respondent bias in the form of non-response bias due to interview time constraints which may have limited the potential depth of insights.
- Time restrictions which may have prohibited the level of insight that would have been achieved otherwise.
- The researcher's limited experience in conducting interviews for research may have limited the level of probing achieved.
- The research was limited to respondents in Gauteng region.

5. Results

5.1 Introduction

This chapter presents and discusses the findings of the interviews conducted with data governance practitioners and data consumers in the banking industry; as we as well as data governance consultants with extensive exposure to the banking industry.

The chapter firstly provides an overview of the respondents interviewed and the interview process. The remainder of the chapter is structured according to the research questions as outlined in chapter 3; namely:

1. What are the components of data governance?
2. What are the objectives of data governance?
3. What key roles are essential for data governance?
4. Who is ultimately responsible and accountable for data governance?
5. What internal and external factors enable data governance?
6. What internal and external factors inhibit data governance?

5.2 Overview of Respondents

Table 2 below outlines a coded view of the interviewees and their respective roles within either the bank or consultancy they work for. The codification used supports the stated intention in chapter four to distinguish between the identified groups, namely data governance practitioners who have been coded as subject matter experts (“SME”); data consumers, coded as “DC”; data creator coded as “DCR” and finally consultants are coded as “CONS”. This specific coding was chosen to enable the ability to compare and contrast the view-points of experts and those of consumers and creators of data

.

Table 2: List of Interviewees

Respondent	Code	Organisation	Role
1	SME 1	Bank 1	Chief Data Officer
2	DC 1	Bank 1	Head of Group Risk
3	DC 2	Bank 1	CIB Chief Analytics Officer
4	DC 3	Bank 2	Head of Capital Management
5	SME 2	Bank 2	Head of Data Governance
6	DCR 1	Bank 3	Head of Risk and Finance IT
7	DCR 1	Bank 3	CIB Head of Data Management
8	DCR 2	Bank 3	Group Data Services
9	DCR 3	Bank 4	Head of Data Security
10	CONS 1	Consulting Firm	Head of Analytics – Financial Services
11	CONS 2	Consulting Firm	Head of Analytics

5.3 Interview Process

Prior to conducting the interviews, respondents were send the interview question guide (see Appendix 2) and the informed consent letter (see Appendix 3) to provide context and ensure that they were in a position to provide substantial insights on the research topic.

In two instances respondents declined to continue with interviews owing to limited knowledge on the subject; whilst one declined as they would have preferred to do an online survey pole as opposed to a face to face interview. This further speaks to the personal nature of qualitative research and the potential insights to be gained from such interaction.

However, it should be noted that some of those who declined referred the researcher to other colleagues who they felt were better versed in the topic. This further highlights that data governance is still relatively new not just in research but also in execution even in an industry latent with regulatory requirements as banking. It was also found that all respondents who agreed to participate in the interview did not have a problem signing the consent letter nor having the interview recorded.

All interviews were conducted at the participants workplace which it is hoped provided a sense of comfort and ability to open up as they were in their natural environment. Despite the author working for one of the banks, none of the correspondent seemed

uncomfortable and nor unable to share their perceptions in fear of giving away trade secrets, but were rather open to share their approach to data governance and also excited to find out the insights the author had on the subject matter.

In a number of the interviews, further discussions after recording was stopped provided interested and more in-depth insights into the topic and more especially around the organisational culture impact on data governance execution.

The interviews were semi structure and relied on an interview question guide of open ended questions to probe the interviewees on the propositions the author seeks to ascertain.

The interview recordings were given to a third party to transcribe in Microsoft word. The transcription process included a few conversation with the transcriber in which they highlighted areas where the conversations were too technical and they were not sure whether they captured the essence correctly. These conversations as well as the author proof reading the transcriptions afterwards provided further insights and emphasized areas where the author might have over-looked crucial aspects because of their perceived knowledge of the subject.

The transcripts were then imported into Atlas.ti for coding. The author used the same codes used for the literature. A report was then generated per code family to identify key quotes per family to form the basis of the argument.

5.4 Research Question 1: Data Governance Components

As a foundation to decipher data governance components, the respondents were initially asked to provide their views on the evolution of data governance by firstly exploring if there was justification in the distinction between IT governance and data governance. It was hoped that this would provide context in terms of whether interviewees deemed data governance as separate from the existing and well researched construct of IT governance. On the basis of this, respondents were then asked what they considered to be components of data governance.

5.4.1 IT Governance and Data Governance

The respondents were asked whether IT governance and data governance should be regarded as the same thing. The aim of the question was to establish whether there is merit in the renewed focus and interest in data governance and what exactly differentiates them.

The general sentiment was that they are different but however cannot be decoupled and therefore there should be clear alignment between the IT and Data governance. This was a general feeling expressed by all three groups.

> *"The IT boards responsible for its governance focus more on the technology and on the data governance side the focus is on the actual data moves within those systems so you need to have a different conversation when talking about data governance… IT governance ensures that the plumbing is right and data governance focuses on the data itself." (SME 3)*

> *"They need to be more aligned. Data and the governance thereof became an IT problem because they have access to the data - but they are not the people held accountable for producing that data- IT is just an enabling function for the governance process. "(DC 1)*

> *"They are different, but need to be aligned; in that way they will be more effective and add value." (CONS 1)*

However, one respondent felt that they are the same and that the current focus on data governance was a result of commercialisation and perhaps consulting firms' ability to make money from it. According to the respondent, the rationale for this was based on the fact that data governance was already in practice within their organisation, albeit perhaps to the extent or level required to yield tangible business benefit.

> *"I don't think they are different; it's like saying information security versus cyber security. Well actually information security encompasses cyber security. The same around data governance, this is my opinion. What is information? Information is data in a valuable form so data governance for me is a subset of*

information governance and effectively IT governance. But data governance is now commercialised and there is huge hype around it; and I guess more money for consultants." (DCR 3)

This question also highlighted that over and above and perhaps by implication of the need to align IT and data governance; the strategies underpinning both need to also be aligned and integrated because ultimately the IT capability enables data governance.

"So the IT strategy is more of an enabler of the data strategy which should be driven by business. But because it's not yet a capability that business has established, the partnership between business and IT is critical as IT has a lot of the intellectual property around what makes up data governance from a process and information perspective and we need to successfully transition that capability so that business can now become adequate at execution around data. In that way they can then step in to enable the governance of data as a business capabilityy." (DCR 1)

"Your IT strategy and data strategy, although historically always the same thing; they are slightly different and therefore should be governed differently. However they need to align." (SME 2)

In this section the link between IT governance and data governance was discussed. The majority of respondents stated that whilst these governance construct are different, they should be more aligned because IT and the governance therefore is an enabler of data governance. One respondent in particular felt that data governance was just a subset of IT governance and should therefore be framed in a similar manner.

Additionally, respondents broadened the need for alignment to encompass IT and data strategies which will in turn ensure that the governance pillar is aligned. Further emphasis was positioned on that these strategies need to be aligned to the business strategy to ensure that data governance is not just seen as a tick box exercise, but rather that it adds real business value

5.4.2 **Data Governance Components**

Secondly, the respondents were asked to define data governance and discuss what they think the components of it are. The intention was to establish the foundation and context within which they viewed data governance and also determine whether there was consensus on those constructs across all groups identified.

A majority of the respondent defined data governance as comprising people, processes and technology. This eminent theme was supported by all data consumers interviewed.

> *"So for me it's all about having that right people, processes and technology- so I think you have got to have all three." (DC 1)*

This view point was further articulated and supported by another data consumer in their response:

> *"Data governance is about ensuring that adequate processes, controls are in place; and that requires discipline and it involves people who are dedicated to looking at it and also involves controls in the sense that we need to know what filters are being applied and what data is being changed and if it is documented why is it being changed." (DC 3)*

This sentiment was also echoed by data creators and consultants:

> *"You can follow a very simple approach in terms of components which speak to people, processes and technology." (CONS 2)*

> *"Focus on defining an operating model including your processes for all aspects. It's about saying, this is a service I can offer and then think about tools and technology after. IT and people then come together in that regard." (DCR 1)*

Respondents gave mixed comments in relation to whether any of these components should take preference and the divide was evident across all three groups. One group felt that all three components were equally important:

> *"..you have to have all three.." (DC1)*

Others expressed technology as being less of a priority in governance.

> *"One can argue that governance does not require technology and the reality is that you can do a lot of governance without the technology, but there are certainly areas where technology enables your governance capability" (CONS 2)*

Additionally, whilst the SMEs and data creators still referred to the identified components above, they further focused on other data management constructs such as data quality and defining data taxonomies and data dictionaries. They viewed data governance and data management as inseparable as the governance of data provided oversight of data management components.

> *" A common language that is consistent across the organisation when you talk about data. So now this talks to taxonomies, data dictionaries, master data management etc; all of which will ensure that there is a consistent way of talking about data". (DCR 1)*

> *"Another key principle is data quality" (SME 3)*

This view was fully supported by the consultants who felt strongly that whilst data management and data governance have in the past being used interchangeably they are different but still linked.

> *"I would separate management from the governance because management is the activity that you do day to day to ensure that the asset is of the quality that you require it to be. Governance is the monitoring and oversight function on top of that." (CONS 2)*

> *"I don't know if you can look at governance and assume that it can work in isolation. It's got to work with metadata, with data quality management as well." (CONS 1)*

5.4.3 Summary of Research Question 1

To set the foundation and establish the history of data governance, respondents were asked whether they felt it was necessary to establish data governance over and above IT governance. The general consensus was that IT governance and data governance are different in terms of the oversight function they administer; one focused on technology or systems and the other on data respectively. However they agreed that their alignment is essential be in place to support business strategy.

On the basis of that groundwork respondents were then asked to articulate data governance components. The majority of respondents highlighted people, processes and technology as fundamental components. The SMEs, data creators and consultants took the discussion further and emphasised the need to view the governance of data within the broader concept of data management as it is essentially the oversight function of data management.

5.5 **Research Question 2: Data Governance Objectives**

Respondents were then asked to state what the objectives of data governance were as it was felt that this was important as it alluded to their perceived strategic placement therein.

5.5.1 Data: A Strategic Asset

In order to execute data governance within an organisation, respondents agreed that it was important that data be viewed as a strategic asset and thus one of the key objectives thereof would be to leverage value from this asset.

> *"We always talk about data as a strategic asset that drives customer loyalty and business growth" (SME1)*

> ‘‘*So I think something that our CEO has said a lot lately is that data is an asset. So the better our data is the better the decisions they can make as a business; because they will be informed decisions." (DC 1)*

> *"I hear more and more nowadays reference to data as the "fuel of the future" or "oil of the future" (CONS 2)*

However, despite the emphatic understanding that data needs to be viewed as a strategic asset, all groups believed that most banks are not yet fully leveraging data as a strategic asset; in some instances they felt that it was not even recognised as such

> *I think if I consider typical banks or financial institutions, I don't think that leveraging data for competitive advantage is the focus. I think it is still a lot more on governance from compliance (DC 3)*

> *"I think in a lot of instances the majority of people actually haven't gotten to the realisation that data is an asset." (SME 3)*

> *"Not yet. So I don't think there has been a compulsion to do so; but I think it's going to happen soon." (CONS 1)*

5.5.1.1 Data Quality

The respondents clarified that the ability to leverage data as a strategic asset could only be achieved through good data quality. One respondent used the following analogy:

> *"I always use the analogy; you know the old saying that garbage in garbage out" (SME 2)*

This was further elaborated by other respondents who linked good data quality to better decision making.

> *"If we fix our data and we are more confident of the quality and completeness it will drive to better decision making across the board in business." (DC 1)*

Alluding perhaps to the current prevalence of data governance in the industry, the respondents referred to the poor state of data quality which over the years had proved a disadvantage to banks.

> *"Poor management of data historically, so almost a laisse faire attitude towards it and people not taking it seriously; but that is changing." (DCR 2)*

5.5.1.2 Data Security

Most respondents mentioned data security as a key objective that is closely linked to data privacy challenges facing banks and other industries.

"We have to ensure that our data is secured and maintain client data confidentiality." (SME 3)

A further justification related to competitive advantage as essentially respondents highlighted that by the ability to secure data assets can negatively impact competitive advantage.

"You want to secure the asset because if you lose it you have a problem and can lose your competitive advantage; and this in the data world links closely to privacy side. This is because that asset is what makes money for you; if you don't have the asset you don't have the business." (CONS 2)

5.5.2 Firm Performance

Firm performance in the form of the business value add of data and inherently having adequate controls and process over it which is a function of data governance came through very strongly especially from SMEs, consultants and data consumers in the analytics space.

> *"..the upside of it is that as the market gets increasingly difficult, people start to recognise the opportunities data provides" (DCR 2)*
>
> *"So our advice is that you have to find where data quality really matters, if you start creating some measurable benefits in an area like that, then it matters to business and suddenly it makes sense for data governance to be implemented." (CONS 1)*

Another respondent also linked the ability to add business value to the competitive advantage possible through data that is appropriately governed.

> *" ..a lot of the ideas of being able to use your data is so that you have the ability to identify new opportunities. People acknowledge that but also know that it is a huge activity. That's part of learning and I think it's necessary because there is a lot more competition between the banks. Pricing is tough so we are looking for ways to be able to come in a little bit cheaper but still make money." (DC 3)*

With regards to business value add, which essentially contributes to firm performance, respondents highlighted two main drivers within this objective for data governance; namely improved customer service and revenue growth.

5.5.2.1 Customer Service

The respondents felt that there has to be a strong link between data governance and the ability to service clients better.

> *"The only thing that makes us more relevant to our clients is if we can interpret the data in their world better. Can we take our data and beneficiate them better? Obviously if we give them rubbish data it doesn't work." (DC2)*

Furthermore, respondents expressed that regardless of whether the strategic focus was regulatory compliance or data insights through analytics or data mining, the objective was similarly achieving better customer service, either by knowing the customer better or the ability to offer them products that were relevant to their needs based on analytics respectively.

> *"I think that companies are forced to use data more and more from a mining point of view to understand the business better, to understand their clients better and the thinking is that if you know your data you can mine it and perhaps you've got some sort of competitive advantage." (DC 3)*

> *"if it is always a stick in the form of regulation then it becomes a grudge purchase; and that may be there and may be needed to add a little bit of heat to the fire. But that on its own is not good enough; it will come and it will go. It needs to make business sense and add value to clients." (DCR 2)*

5.5.2.2 Revenue Growth

Respondents were adamant that a key data governance objective was that is facilitated the ability to monetise data. This was regarded as a solid business case for data governance that would ensure that it gets prioritised. However, they noted that a majority of banks have not achieved this as yet.

> *"But we haven't turned that into a monetised pool of revenue linked to strategic objectives and outcomes; which a lot of other companies have done. So that's a key focus for us that is currently missing" (DC 2)*

> *"So you either do something on the value side like a campaigns capability which you can measure the uptake and campaign conversion or you do it in something that really hurts like compliance or regulatory requirements." (CONS 1)*

As a result there was strong sentiment that banks need to focus more on the revenue creation enablement afforded by data governance as opposed to the currently.

> *"I am an optimist so I always consider that data governance from a business value add perspective, that is far more attractive than doing this because we have to be compliant." (DCR 2)*

5.5.3 Risk Mitigation

Risk mitigation pertaining to data was mentioned repeatedly as a data governance objective by respondents.

> *"From a risk perspective the fact that you are managing your business on inaccurate data should be very concerning as your financial numbers are being reported to stakeholders and shareholders around your performance as a Group." (DCR 1)*

Furthermore, there was consensus that this objective had been at the helm with regards to advocating for data governance specifically in the banking industry.

"There are certain legislative requirements that state that you must retain data for a specific period of time or you may not retain this data for a longer than a certain period of time or longer than you need it." (CONS 2)

5.5.4 Cost Reduction

Respondents felt that the cost saving potential to be gained through by data governance would be in the form of regulatory fines avoided which inherently add up and increase the cost of capital. One of the consultants elaborated further on this point as follows:

"We already know that the next round of fines is going to be over a hundred million rand, if not a billion. We also know that banks are going to get a lot more capital add-ons due to data quality issues. That means an increase in the cost of capital!" (CONS 1)

Similarly, respondents spoke about existing disparate data architectures and systems within banks which cost banks a lot of money yearly. They believed that the ability to rationalise existing systems through identification data governance principals such as the identification of golden sources of data would significantly reduce these costs and enable integration.

"You cannot have one bank if you don't start integrating all your systems and that requires data governance" (SME 2)

5.5.5 Enterprise Data Integration

Additionally, respondents identified enterprise wide data integration in support of the data governance imperative. A majority of banking employees, both SMEs and data consumers referred the strategic objective predominant in most banks currently which advocates moving towards an integrated bank enabled by consolidation of data across all business units; part of which requires a single view of client.

"I think that there is definitely value to be gained and opportunity from taking a single client view on products in the bank whilst looking at the return that you make on a particular client; which price they are in, is there a niche product that they don't have

and then sort of, if you are entering into a new transaction which is where business is going, in terms of banking is looking at what sort of return are we making or what kind of capital are we making on a particular client." (DC 3)

"You cannot have one bank if you don't start integrating all your systems and that requires data governance" (SME 2)

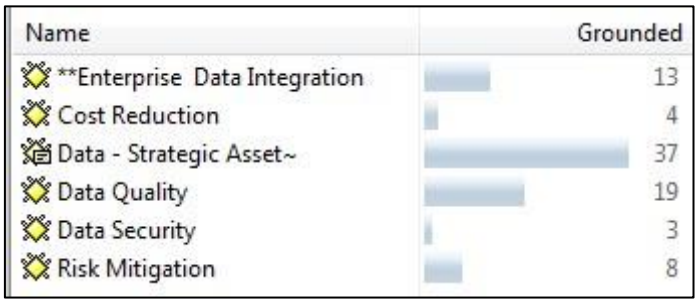
One of the respondents elaborated further expressing that the prominence of regulations driving data governance and the growing view that data is a strategic asset are forcing organisations to integrate their data.

"So for the first time, there is a need to create an enterprise view of data" (CONS 1)

5.5.6 Summary of Research Question 2

The figure below represents the Atlas ti. output showing the number of times respondents mentioned an objective as represented by the number under Grounded which is the frequency of mention. It is to be noted that whilst only eleven respondents were interviewed, they referred to each construct multiple times during the cause of the interview.

Figure 5: Data Governance Objectives



Considering the objectives of data governance, the most common theme expressed by all groups interviewed was that data is increasingly being viewed as a strategic asset. Therefore, like any other asset there needs to be an oversight function governing it.

Furthermore, the respondents ascertained that to leverage data as a strategic asset, it is crucial to understand how managing this asset through data governance translates

into the ability to achieve better data quality and securing the data asset.

They also identified the ability to leverage this strategic asset as the key to unlock the other identified objectives relating to firm performance, risk mitigation, cost reduction and also introduced an additional yet valid objective of enterprise integration which was not covered in literature.

5.6 Research Question 3: Key Data Governance Roles

The respondents were asked to provide their views on key data governance roles. The aim of the discussion was to determine whether key roles exists that are critical in driving data governance.

5.6.1 Data Owners

During the interview process it became very clear that all respondents regarded data ownership as a key element in data governance.

> *"…the responsibility should be with the data owners and the data owner is very well defined as every single person who generates data." (DC 2)*

> *"…data ownership is key. And it is one of the things we need to establish before anything else." (SME 3)*

Respondents further emphasised that a shift is required in so far as data is concerned wherein IT was previously assumed to own data. There was unanimity that business should own data.

> *"So I think that the people who generate the data are the ultimate owners of it so each business area that generates the data." (DC 3)*

5.6.2 Sponsor or Champion

Respondents highlighted the need for a senior person to sponsor and champion data governance initiative within the organisations.

"a sponsorship role is critical." (CONS 1)

Some of the respondents felt that this role could easily be taken on by one of the existing senior executives.

Additionally, some respondents felt that should such a person not exist, then this could warrant creating a role that would drive data governance.

"There has to be some champion or evangelist to get the conversation going and if such a person does not already exist in the current executive, then there may be a need for somebody to come in and light that fire." (DCR 2)

5.6.3 Emerging Roles – The CDO Role

Respondents were asked to provide their views on new data roles especially that of the Chief Data Officer. The intent of the discussion was to solicit how this role applies to data governance and determine the validity thereof.

The respondents gave varied views on whether this role was needed. Some supported the role and sighted that it would fulfil the sponsorship and champion role discussed above. The data consumer group was generally in support of the role.

"and maybe that is the function of the CDO to bring both the function of business and IT together to drive data governance… the fact that we are now setting up the CDO function, we are looking to rollout data standards" (DC 1)

Some of the SMEs emphatically disagreed with the role and felt that other roles within the bank are sufficient to fulfil drive data governance as it was not.

"I disagree with the fact that there should be a Chief Data Officer." (DCR 3)
"So the role of a Chief Data Officer is not a silver bullet." (DCR 1)

In contrast, some of the respondents who expressed a need for the role of the CDO highlighted those existing roles and other emergent roles who not be able to execute

that role efficiently given their other portfolios. Additionally that it was a different skill set required in that role.

> *"They can't do both so it's hard to say we need both roles fulfilled by the same person. Also these jobs are difficult because it's fairly new and people don't yet know but everyone gets excited about it because they haven't seen what other companies can do." (DC 2)*

5.6.4 Summary of Research Question 3

In an attempt to understand key roles pertinent to data governance, mixed responses from the participants regarding some of the key senior roles pertaining to data governance. This was specifically in reference to the CDO role which has become a trend recently.

Based on the consolidated responses from participants, it would seem that there are existing roles within most banks that can drive data governance both at a senior level and embedded within the business units. However, because this is still a relatively new phenomenon and the state of data within the banking industry which was allowed to deteriorate over the year and depending on the organisational structure, there is potentially a need to create a centralised function to drive data governance within the organisation. Respondents were very clear that this does not translate in this centralised function being solely held accountable for executing data governance within each of the disparate business units.

5.7 **Research Question 4: Data Governance Accountability**

Respondents were asked who they believe should be accountable and responsible for data governance. They mainly concurred that everyone within the organisation should be accountable for data governance and that this responsibility does not sit with one person.

> *"For me data governance is everyone's job…So now, we would rather instil data governance in such a way that people basically understand that they are all responsible." (SME 2)*

"I don't think it can be with one person" (CONS 2)

"..every single employee, every single staff member who accesses data is responsible and accountable for ensuring that proper controls are applied to that data. And that's a big mind shift." (DCR 3)

There was also a view that leadership within each business area was ultimately responsible and accountable to ensure that people within their specific area govern the data they own appropriately.

"So my theory is top leadership should take accountability for data that sits within their relative business units and then as a cultural transformation occurs it will get cascaded to everybody else will take accountability for it." (SME 1)

In relation to the Chief Data Officer role or a similar be it an existing role, respondents it was generally agreed that they were responsible and accountable for providing the oversight; however execution will remain the responsibility of each business area. This highlighted a general sense that there should be a top-down and bottom-up accountability approach.

"You have got to do a top-down and bottom-up. So the CDO has to drive the top-down approach looking at the governance, kind of overall standards and tooling then you need the CRO (Chief Risk Officer) in each of the different business units to also own up to their responsibilities and do the bottom-up of making sure they have the right people are in place, making sure we have the right IT tooling that they can implement it in the business unit" (DC 1)

5.7.1 Summary of Research Question 4

Based on the feedback from the respondents, it can be concluded that you can centralise the overarching or oversight of data governance to drive setting policies and standards that would be applicable group-wide.

However, all the respondents were very clear that the responsibility and accountability for data governance is essentially the obligation of everyone in the organisation. This

was strongly tied to business ownership of data and the enabling function IT plays in ensuring that business is able to govern the data that they own.

5.8 Research Question 5: Data Governance Enablers

Having established, the components, objectives, roles and accountability for data governance, the respondents were asked their opinions on what they felt were enablers of data governance. The respondents referred to the below enablers.

5.8.1 Data Ownership

Respondents expressed the crucial role business ownership played in data governance. There was consent that the uptake of data ownership by business would drive data governance enablement.

> *"The owner of the particular business has to take ownership of the data aspects of that business." (DCR 2)*

> *"Business will always own data." (CONS 1)*

In support of previously stated views that a role such as that of the CDO cannot be a data owner, nor can this responsibility be given to IT, respondents emphasised that data ownership cannot be bestowed on one person.

> *"This is something that I experience at another organisation where the appointment of a CDO resulted in some of the business areas wanting to relinquish their responsibility as data owners with the view that this newly appointed person should own all the data which cannot be the case; business must always own the data." (SME 3)*

5.8.2 Information Growth Rate

Whilst respondents did not explicitly identify the rate at which data is growing in relation to driving data governance, they alluded to this association in discussion on data as a strategic asset for competitive advantage and prevailing data related business trends.

> *"…the more data you collect the more you need to know what to do with it, the more you know what to do with it the more competitive you are and so on." (DC 2)*

Conversely, there were views that this growth information added complexity to the governance process as companies are no longer just dealing with structured data but also have to leverage unstructured data; a typical example of that being social media data.

> *"In the new information age this data is now split into structured and unstructured data. This needs to be considered processing data attestation." (DCR 1)*

In general respondents viewed the rate at which data was growing as an impediment to data governance as banks now had to cater for both structured and unstructured data which is a massive ask from a governance perspective.

5.8.2.1 Data Related Business Trends

In relation to data being a strategic asset, respondents referenced existing data trends that necessitate the need to govern data generically and highlighted that this was a fairly emergent area of interest for banks.

> *"There is the world of data, the world of data analytics, big data and all that is fairly new and there is very few people who know it and get it and understand where it could go" (DC 2)*

However some respondents felt that whilst the influence of such data trends was undeniable, currently the regulatory push for data governance is still the main angle from which such initiatives are undertaken.

> *"It is still a lot more on governance from a compliance perspective." (DC 3)*

Specifically in relation to these trends, respondents referred to digitisation, analytics and big data.

Digitisation

Respondents highlighted that most banks are moving towards being digital and that is where data as an asset becomes critical.

> *"If you consider where the banking industry is going; most are trying to go completely virtual. So what is then the real asset? It is that underlying data" (CONS 2)*

However cautionary notice was given to ensure that the state of the data used is fit for purpose to realise the objectives of digitisation.

> *"Data is the shadow of digital. So wherever digital goes, data has to be there; because that is the next frontier. But we need to fix that data." (DCR 2)*

Analytics

Respondents expressed how the need to know clients better and make informed decisions was pushing banks and other organisations to analyse their data and the business value add to be gained from the analytics. The consultant group had very strong views on the need to view data governance in the context of the analytics capability.

> *"Global estimates of benefits from proper customer analytics, it is significant. It's like ten to fifteen percent increment of your bottom line." (CONS 1)*

A majority of respondents supported this as they mentioned how data governance unleashed the analytics capability as it validated the quality of data and hence was a business case for data governance initiatives.

> *"Without data governance it, the quality of the data used for the analytics exercise might end up having a negative effect on business." (SME 3)*

However, it was felt that the concept of analytics was still relatively new and as such banks were not yet using it to build a case for data governance.

> *"The concept of analytics and customer insights is relatively new." (CONS 1)*

Big Data

In relation to big data, respondents were clear that it was instrumental for data

governance. Furthermore that perhaps it has been instrumental in promoting data governance awareness.

> *"The hype of big data is pushing people to realise they turn data into strategic assets. Good data leads to good decisions then you start to scale and grow but that is just the start." (DC 1)*

As such, big data was viewed as one of the emerging trends that have led to banks recognising that they need to consolidate existing incongruent data governance efforts. The sentiment was that this would enable to leverage big data and gain group wide value.

> *"There are pockets of efforts across the organisation, but it is not done in a systematic and scalable way or in the right way in order to make sure that the entire bank benefits." (SME 1)*

5.8.3 Organisation Strategy

The ability to align data governance initiatives to strategic objectives was highlighted as a crucial for its success and uptake.

> *"Set a strategic objective that people can target towards and then say if I want to achieve that thing, data governance and all of that will have to be in place to make us achieve that strategic goal. Leadership needs make sure that there is strategic buy-in and then democratise the data." (DC 2)*

It was further elaborated that data governance would achieve such strategic alignment as it will drive improved data quality which in inherently result in better decision making.

> *If we fix our data and we are more confident of the quality and completeness it will drive to better decision making across the business." (CONS 1)*

One respondent alluded to the need to align IT strategy to the overall strategy specifically on understanding the cost implications of changing technology that is used for data governance.

> *"You actually spend a lot of money on your technology and it becomes very*

difficult when you have invested in one technology and it becomes difficult when that strategy changes because there is not enough budget to keep changing strategy." (DC 1)

5.8.4 Organisation Structure

Respondents all agreed that organisational structure was key to rolling out data governance. To a large extent, they felt that the way banks are currently structured was problematic and actually hindered progress in executing data governance.

"..one of the biggest stumbling blocks is how banks organise themselves. The banks organisational structure is going to be a key driver in terms of how difficult or easy it is to implement data governance."
(CONS 1)

A key issue relating to structure were the silos that exist as respondents indicated that because business units traditionally operated in isolation, it was difficult to scale a holistic strategy for data governance.

"In most big organisations; the more silos in the organisation, the more difficult it is to drive data governance because each business unit operates like as an individual entity; so it becomes difficult to get buy-in." (DC 3)

"One of the hardest things to do in an established organisation is to do things across the traditional silos." (DCR 2)

Despite this implement view for a central structure to drive data governance; one SME who had occupied such a central role previously felt that presented issues when-in business units felt that the central Group function was dictating standards and controls to them.

So when I was at another bank, it was difficult because I was sitting in a Group function which was centralised. People would say that Group is just dictating standards to them (SME 3)

Some respondents further made a link between the size of the organisation and the

ability to change the culture. The prominent conclusion indicated that smaller banks were better positioned to transform the culture quicker than the bigger banks.

> *"We are lean on the ground, so we don't have a lot of people so I would rather we make it a part of the culture. So the culture is a little bit different for us so that's our enabler; the fact that we are so close to our managers, our senior decision makers." (SME 2)*

5.8.5 Industry Regulation

Most respondents made reference to current banking industry regulations which they felt were providing the necessary focus on data governance.

> *"There are currently a number of regulatory requirement that are creating a business re-emphasis on data and it's governance within the banking industry and they are actually driving a lot of behavioural change" (DCR 1)*

There was also sentiment that industry regulation seemingly advocated for enterprise-wide data integration as recent requirement guidelines were for data across different business areas.

> *" Increasingly new regulation is driving that various disciplines need to co-exist better so if you think about new regulations which require all three elements of market risk, credit risk and liquidity to come together in one place and pulling on one lever." (DC 3)*

However, some respondents felt that regulation was an inhibitor because of constant updates and new regulations with strict deadlines that did not necessarily afford banks the opportunity to design sustainable solutions.

> "*I would definitely say regulation and compliance requirements. If feels like they change every week. They don't give you enough time to implement properly and settle because they start piling on new requirements." (SME 2)*

Furthermore and in relation to regulation pertaining to data and technology, one respondent felt that the regulator was out of their depth with regards to setting fit for

purpose regulation due to the rate of change in data and technology trends.

> *"So the Reserve Bank is sort of out of their depth in some aspects when setting regulations around data and technology because things are moving so fast, but they are also very conservative in their approach to these things. It's new problems and new technology solutions." (DC 2)*

The same respondent cautioned against regulation and governance of data in a similar manner to other disciplines as this would destroy the ability to derive value from it.

> *"If we try to govern it in the same way that we did with everything else; put a lot of controls onto it then we are going to stop a lot of cutting edge changes from happening and I think in that way you would actually kill the value of data. You want to democratise data." (DC 2)*

5.8.6 Investment

All respondent groups represented were in agreement that some level of investment is required to ensure the ability to execute data governance.

> *"Banks need to realise that you have got to spend money on this thing, if you hope to have good data. So it will soon galvanise the mind when fines start coming or customers get irritated; the consequences." (CONS 1)*

> *"What business can do to give it more importance is to put it side by side with the business priorities going forward; the first two to three years are big for investments." (SME 1)*

However, some respondents warned that it was essential to ensure that the investment decisions are well thought through and are aligned to business decision. This was especially linked to the technology investment which should ultimately add real business value in the long term.

> *"You actually spend a lot of money on your technology and it becomes very difficult when you have invested in one technology and we are part of a broader group and they come up with a strategy. It's very difficult when that strategy*

changes because like I said there is not enough budget to keep changing strategy" (DC 1)

5.8.7 New Technology

Within the identified data governance components, most respondents felt that existing and new technology that was an enabler as it allowed ease of data governance incorporation in existing processes and thus more sustainable

"why I made the point around technology earlier because if we can automate data governance, then it can easily become part of the way we work and those outcomes are achieved by default (DCR 2)"

It was further noted that technology required to enable data governance is has become user friendly which aids business in this endeavour.

"the tool sets that actually expose our information are now becoming so user friendly that you don't need to be an IT competent person to do business analytics, reports et cetera." (DCR 1)

Despite consensus that technology eased the ability to execute data governance, respondents were still adamant that technology not a necessity for execution.

"One can argue that governance does not require technology and the reality is that you can do a lot of governance without the technology, but there are certainly areas where technology enables your governance capability." (CONS 2)

Conversely, one respondents felt that the fast pace at which technology in general changes meant that it could be both and enabler and inhibitor.

"One thing I think is both an inhibitor and an enabler is technology. Because the new technology helps us build better things however, it changes so often that we continuously have to change and upgrade. "(SME 2)

5.8.8 Summary of Research Question 5

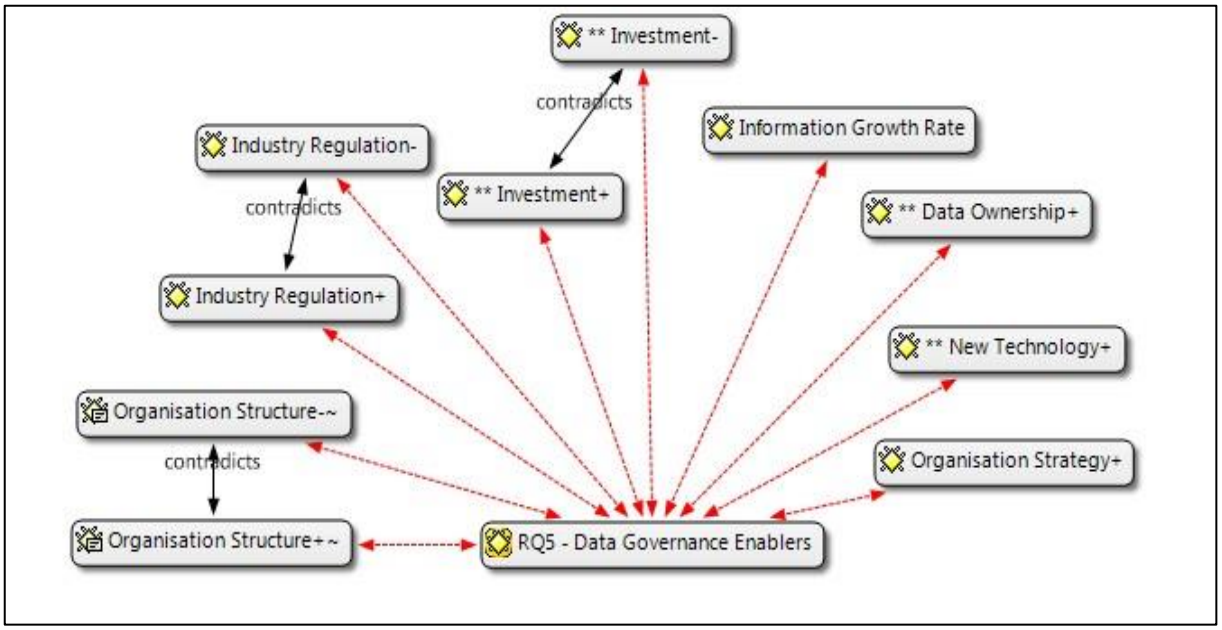
In an attempt to understand factors that enable data governance within the banking industry, the discussion focused predominately on data ownership and data related trends such as analytics and big data in line with business strategy which they felt were highlighting the need to govern data.

The discussion also focused on the structural make-up of an organisation including the need to drive behavioural change by ensuring that it is linked to incentives and key performance indicator. Furthermore the need to invest in technology and data governance initiatives, especially in early stages to ensure successful implementation was noted. Additionally, regulation was also a strong theme discussed in relation to this question.

Based on respondent feedback, whilst there was consensus that these were factors that influence data governance, there were mixed views on the categorisation of these factors as enablers across all three groups interviewed.

Figure 7 below depicts the contradictions mentioned as developed in Atlas ti.

Figure 6: Data Governance Enablers Network



5.9 Research Question 6: Data Governance Inhibitors

5.9.1 Legacy Systems

Banks are synonymous with legacy systems across which their data resides. This theme was strongly expressed by data who viewed it as a challenge to constituting data governance.

> *"They present issues…and some of the challenges that you have is that overtime you have added all these little mainframes and also they become out of date and not compatible with some of the latest technology; then governance becomes an issue." (DCR 3)*

However, some of the respondents believed that this challenge could easily be overcome by firstly identifying golden sources of data and that combined with the appointment of data owners would form the foundation in establishing data governance.

> *"Data owners need to rationalise the legacy systems that exist and determine the valid golden source for data. In that way the owners start ensuring that only the golden source of information gets published and used throughout the organisation." (DCR 1)*

Thus the opportunity to drive consolidation of data from disparate legacy systems as driven by data owners was viewed as a data governance enabler.

Furthermore, one of the data consumers felt this had to be achieved as these legacy systems represented a revenue source based on the data housed there in.

> *"You are sitting on a legacy that we can actually turn to cash." (DC 2)*

To this end, some of the respondents felt that legacy systems were not actually an issue and that the real focus should be on establishing standards and rationalising the data architecture landscape which will inevitably address legacy system concerns.

> *"Data governance has less to do with legacy systems and more to do with*

appropriate practice. The components that you need could be abstracted out. The disciplines that need to be entrenched are not massively technology dependent." (DCR 2)

"With fragmented data architecture you are always going to struggle. (CONS 1)"

The same consultant further elaborated on the cost saving benefit that would be gained from rationalising existing systems.

"If you have proper data architecture and remove all of the intermediate data marts that exists in most banks and when you add up the cost of running all those applications, it's in the millions." (CONS 1)

5.9.2 Product Complexity

On the basis of the legacy systems discussed in the previous section, and customer needs, some respondents identified product complexity as a challenge when instituting data governance.

In specific reference to the pursuit to meet ever changing and complicated customer needs, one respondent felt that front office sometimes designed complex products that were not necessarily fit for implementing appropriate data governance on.

"What happens is that someone decides that I am going to sell a Swap trading instrument like pig skin and banana peels and you go like how do we price that, how do we book that trade into a system where none of the systems actually cater for pig skins. So you end up jeopardising the integrity of the system and the governance of the data to accommodate such products." (DCR 3)

Despite this challenge, SMEs reiterated that banks still needed to provide an consolidated view of a client's products which is one of the objectives of data governance; further adding to the complication.

"The same product will not sit in multiple systems; yes the client can have multiple products but that should be seamless." (SME 3)

In contrast, respondents were well aware that this level of product complexity was a source of competitive advantage for banks and therefore part of the data governance function would be ensuring that even for such products, data integrity can be maintained.

> *"The competitive advantage of some of these complex products is where you make money so yes the data governance around how do I make sure that my IP is protected but I am still within the compliance regulations of what I am actually doing." (DCR 3)*

5.9.3 Organisational Culture

Prevailing culture came across as the strongest data governance inhibitor as it was mentioned by all respondents. All respondents interviewed were adamant that a cultural shift was required to enable an environment that viewed data as an asset and therefore understood the necessity to govern it. Most respondents felt strongly that this was the key inhibitor to data governance.

> *"The challenge is always trying to change the culture within the organisation. So if you want a more data led culture where the conversation is less around emotions and more about the data points; then that is a shift; that is a transition." (DCR 2)*

> *"You will not succeed in the long term if you do not understand that it requires a cultural change and a cultural change is difficult for large organisations. It is difficult to make that fundamental change in the DNA and I think that is what everyone is struggling with." (CONS 2)*

Some respondents felt that this cultural shift was already in progress.

> *"I think it is changing, the culture is changing in the firm. I think a year and half ago the CEO made a comment that we need to make sure that we treat data as an asset so I think it is starting to influence the way IT people work, the way the business executives work" (DC 2)*

Whilst others felt that was not yet the case as yet.

"I don't think that culture is there." (DCR 3)

Another respondent felt that their existing culture driven by their values was actually enabling the update on data governance.

"Another thing, which will enable data governance, is our values. We hope our entrepreneurial culture and values help people adapt and adopt data governance fast." (SME 2)

Within culture as a factor, respondents specifically indicated linking data governance objectives to incentives and allocating key performance indicators. Secondly the element of dynamics and personally agendas came through as a strong component of culture.

With regards to incentives and key performance indicators, all respondent groups identified adding data governance as a key performance measure linked to incentives to drive adoption. They attributed the lack of commitment to data governance initiatives this missing link in most banks which they felt would change behaviour and the culture.

"It has to be incorporated in people performance measurements and say these are the standards and you need to comply and if not these are the implications. It's the only way." (DC 1)

"One of the things we want to do internally in line with that is introduce incentives for people that actually value and practice data governance and for those that don't, let's have penalties." (SME 3)

Furthermore, this was linked to culture by implication that people were more likely to change behaviour and culture if there were incentives associated to such a shift.

"Linked to that are things like incentives and remuneration structures and performance measure because how people are measured drives behaviour." (CONS 2)

Regarding employee dynamics respondents strongly felt that the cultural change required was a product of employee behavioural change which was seen as

instrumental to this process.

> *"It involves changing how people think; it involves changing how people behave" (DC 2)*

As part of the discussion, respondents identified three additional enablers of behavioural change that required attention; namely: skills development and training, staff turnover and internal politics. These were over and above linking data governance to incentives and key performance indicators.

Regarding skills and training, a majority of respondents felt that banks did not currently adequately train employees to execute data governance.

> *"Very few banks have this in their training programs." (CONS 2)*

> *"If we do not educate people about the impact of data issues downstream all the way to reporting, we are not going to succeed". (SME 3)*

One respondent went further to indicate that they had taken it upon themselves to educated people of the implications of a lack of data governance evidenced by data quality issues.

> *"You can't just tell people that the data is wrong; I teach them, show them the end result of their mess. That's what I do and I explain to them what we had to do to unwind the mess or I give it to them to fix; that's how you learn. That is what will drive data governance." (SME 2)*

Furthermore, and coupled with training, staff turnover was highlighted as an inhibitor as it meant transferring the skill set and ensure that you hire people that are adaptable and open to change to ensure that there is momentum.

"Staff changes are always a massive thing in terms of keeping the momentum going." (SME 2)

Finally, internal politics and personal agendas were stated as another aspect that would derail data governance progress.

"The most obvious one is organisational dynamics, politics and personal agendas. It is not always in everyone's interest to highlight data quality problems. Sometimes it is human just to hide it." (CONS 2)

5.9.4 Data Governance Execution Approach

Respondents frequently referred to data governance execution as a problem. Thus, they implied that setting the policies and standards was fairly progressed, however, the executions was still lacking.

> *"The policy is quite clear but is not well implemented yet." (DC 2)*

The lag in implementation was associated with the need to transition data governance control from IT to business.

> *"Fundamentally it is the way we execute currently because we still see IT as primary in execution of data governance and this becomes a bottleneck because business will not take it seriously. So until business takes back control of this uncontrolled area, we will still be sitting with the same problem." (DCR 1)*

Furthermore, it was noted that the complexity introduced by banks in rolling out data governance meant that it could not seamlessly be incorporated into existing processes.

> *"Make it easy; not too complicated or cumbersome. It is a lot of extra work at the moment rather than this is something that is part of the way we operate which leads to poor execution." (DCR 2)*

To this end, most respondents agreed that the execution should be incremental and linked to other business value add initiatives within the analytics and data management domains.

> *"A more incremental approach probably has a stronger chance of success if you follow a more incremental approach than taking a big top down approach in which you want to implement a full data governance capability which invariably*

a year or two down the line will disappear." (CONS 2)

5.9.5 Economic Conditions

Although economic conditions did not come through as a strong theme amongst respondents, it was still a noteworthy argument which some of them referred to even indirectly. One respondent expressed budget spent restriction on data governance during an economic downturn environment.

> *"Factors that hamper data governance; I think economic conditions. I think it's difficult, if times are tough and the business is doing badly to justify big spend on data governance." (DC 3)*

Furthermore, it was noted that despite potential budget restriction on data governance restriction, the competitive environment within which banks currently operate in due to the same economic condition difficulties.

> *"The upside of it is that as the market gets increasingly difficult, people start to recognise the opportunities data provides" (DCR 2)*

5.9.6 Summary of Research Question 6

The respondents were asked to discuss what they felt were data governance inhibitors. Some of the strong factors included culture, legacy systems, data governance execution. Furthermore, less quoted but still relevant factors discussed included product complexity, and economic conditions.

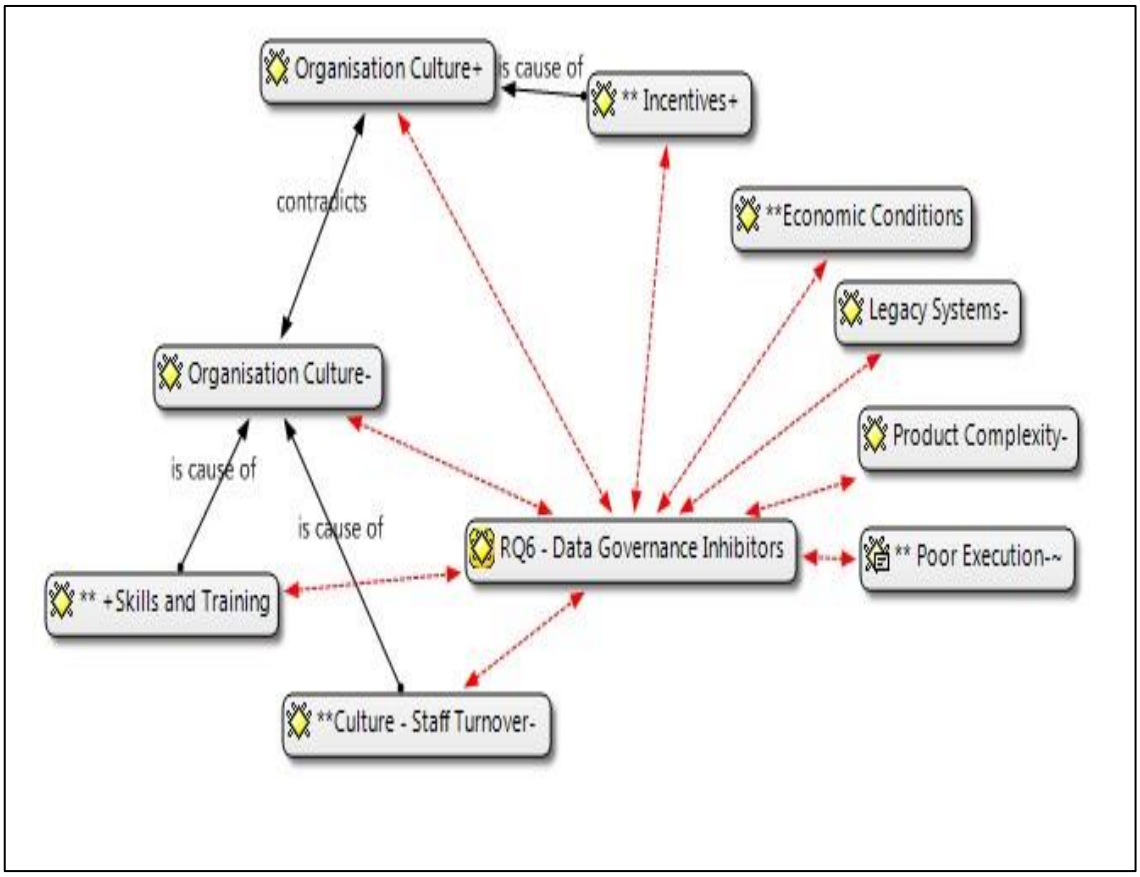
Similarly to research question 5 presented in section 5.8, there is inconclusive evidence that these are viewed as inhibitors in general as some respondents took an optimistic view on their impact in so far as data governance execution is concerned.

Figure 8 below highlight and network view that clearly depicts the tension in classification of these factors relating to data governance. Where positive sentiment was coded from the respondents, a plus sign was added to the end and a minus sign where the opposed was detected.

As per Figure 8 below, this was very evident with culture where opposing views on the impact of culture in banks were expressed. Respondents provided supporting evidence of further factors that are deemed to either promote or hinder the influence of prevailing culture on data governance.

It is to be noted that the extensive coding and contradictions highlighted in the figure are indicative of how strongly respondents felt about the pervasive role of culture with regards to how it affects data governance.

Figure 7: Data Governance Inhibitors Network



6. Discussion of Results

6.1 Introduction

In light of the interview based findings discussed in chapter 5, this chapter endeavours to provide insight into banking industry data governance stakeholder perceptions pertaining the components, objectives, roles, accountability, enablers and inhibitors thereof. This will be achieved through an interpretation of the results based on the literature outlined in chapter 2. The findings will support, contradict or complement existing literature in this area.

The research questions addressed in this chapter are re-stated below:

1. What are the components of data governance?
2. What are the objectives of data governance?
3. What key roles are essential for data governance?
4. Who is ultimately responsible and accountable for data governance?
5. What internal and external factors enable data governance?
6. What internal and external factors inhibit data governance?

6.2 Research Question 1: Data Governance Components

The components of data governance are discussed in two sections. Firstly to set the foundation, a need to study data governance through an assessment how it differed from IT governance which is well researched (Kooper et al., 2011; Weill & Ross, 2004). Secondly, the discussion focused on a comparison of components identified in literature and the results of the qualitative research.

6.2.1 IT Governance and Data Governance

In chapter 2; specifically section 2.2, the literature review indicated that Khatri and Brown (2010) recognised the need to separate IT governance and data governance as the former focused heavily on software applications and infrastructure, whilst the need to institute the latter was required due to growing recognition that data is a strategic asset. The interview discussion with respondents detailed in section 5.4.1 to establish perceptions of both forms of governance support literature as the majority of

participants agreed that these two constructs were different and one of the respondents illustrated this by using analogy that IT governance ensured controls and process over the plumbing whilst data governance focused on the same constructs over data.

Based on this, it can be concluded that IT governance and data governance are separate constructs and therefore validates the need to further explore a data governance specific framework.

6.2.2 Data Governance Components

Based on the discussion with respondents as outlined in section 5.4.2 three generic data governance component namely people, process and technology were identified by respondents. In section 2.3 of the literature, Tallon et al. (2013) proposed a model which highlighted three main data governance practices: structural practices, procedural practices and relational practices. An evaluation of the constituents of each practice indicates a direct correlation to processes, technology and people respectively and as articulated by respondents in chapter 5.

As a result, the findings directly support literature and indicate a firm grasp of concepts that make up data governance.

6.2.3 Summary of Research Question 1 Discussion

An evaluation of the feedback by respondents aligns to the identified components in literature by Tallon et al. (2013). Respondents mainly referred to people, process and technology as the component similar to the proposed structural practices, procedural practices and relational practices constructs as suggested by Tallon et al. (2013).

6.3 **Research Question 2: Data Governance Objectives**

From literature drawn in section 2.4, it is evident that persuasive objectives linked to business drivers are required to motivate the need to constitute data governance (Panian, 2010; Kooper et al., 2011; Korhonen et al., 2014). The main objectives identified were: leveraging data as a strategic asset, firm performance, risk mitigation and cost reduction. However, it was unclear from literature whether these objectives, especially firm performance and leveraging data as a strategic asset were currently

recognised as major business drivers with value add (Panian, 2010).

The participants reiterated these objectives and further added enterprise data integration.

6.3.1 Data: A Strategic Asset

In section 2.4.1 of the literature, Khatri and Brown (2010), Kooper et al. (2011), Otto (2011) and Panian (2010) all agreed that data was a strategic asset and could be a competitive advantage. Korhonen et al. (2014) further advocated for data governance initiatives that aligned to this strategic objective.

Based on respondent feedback in section 5.5.1 most were in agreement that data was recognised as a strategic asset within most banks, albeit they expressed that this realisation had not yet gained scale throughout most of these organisations. Furthermore, a majority of respondents were not convinced that banks are currently leveraging this strategic asset which alluded to issues in their data governance approach should unlock the value add of enterprise data.

These findings support literature as the respondents agree that data governance will enable banks to leverage data as a strategic asset. However, additionally in support of literature, it was agreed that most banks have not managed to effectively achieve this objective.

6.3.2 Firm Performance

According to literature in section 2.4.2 a link has been established between data governance and organisational performance (Khatri and Brown, 2010; Kooper et al., 2011; Tallon et al., 2013). Korhonen et al. (2014) suggested that this performance be measured on two aspects, namely effectiveness and efficiency. However, the extend to which is had been established was undetermined (Tallon et al., 2013).

Respondents agreed with the strategic alignment of data governance to organisation performance. They specifically elaborated on two aspects of performance that would be applicable to measuring whether data governance goals were achieved. These were customer service and revenue growth.

These findings both support and add on to literature as they support firm performance as an object and add on to Korhonen et al. (2014) by taking proposed generic measures of effectiveness and efficiency and directly linking them to tangible strategic objectives namely customer service and revenue generation; which can therefore be used to determine the extent to which data governance meets this objective.

6.3.3 Risk Mitigation

Based on respondents interviewed, risk mitigation was mentioned several times as a data governance objective. They furthermore felt that in so far as the banking industry was concerned it has been the key objective and business case used to drive data governance initiatives.

These finding support literature as stated in section 2.4.3 in which Tallon et al. (2013) implied risk mitigation on data security related issue as a data governance objective. This was due to prevalent regulation pertaining to data security (Pytlik & Myers, 2010).

6.3.4 Cost Reduction

A link was established in section 2.4.4 between regulatory compliance and escalated costs for organisations (Pytlik & Myers, 2010). As a result, Tallon et al. (2013) suggested that this would be one of the main data governance objectives.

In section 5.5.4, respondents concurred with this view and linked costs associated to not just regulatory but also highlighted cost implications of disparate and legacy systems which inhibited the ability to govern data.

As such, the findings from respondents support literature.

6.3.5 Enterprise Data Integration

Although enterprise data integration was not explicitly identified as a data governance objective in the literature review, Li et al. (2011) referred to cost implications organisations incur due to incapability to represent a single view of their customers. Additionally, this also deterred them from performing analytics that would lead to

insights which can translate to profits. The constraint to achieving a single view of client is stated to be a result of incoherent client data across multiple systems which has already been established as a product of the absence of data governance.

Respondents within the banking industry context stated a major strategic drive to achieve a single view of client. Furthermore, respondents alluded to prevailing regulatory requirements that advocate for integrated data across multiple business units. They felt very strongly that this cannot be achieved without introducing appropriate data standards and controls.

The findings therefore add to literature and imply that enterprise data integration should be considered a data governance objective.

6.3.6 Summary of Research Question 2 Discussion

Respondents identified four objectives for data governance within the banking industry. These included leveraging data as a strategic asset, firm performance and risk mitigation which are aligned and thus support the literature reviewed. Moreover, they felt that enterprise data integration should be a key objective for data governance. The latter therefore adds to literature.

6.4 **Research Question 3: Key Data Governance Roles**

Key data governance roles are discussed in this section in relation to banking industry within which respondents operate. Given the centrality of allocating decision making rights and accountability in data governance, it was considered critical to understand what roles respondents thought were critical

6.4.1 Data Owners

The key role identified by respondents in section 5.6.1 was that of data owners. Respondents felt strongly that not only was this role pivotal to data governance there was also a need to ensure that within the banking industry, a clear shift occurs towards recognition that business owns data; not IT.

In section 2.5.1 of the literature, Khatri Brown (2010) identified data owners as a critical role accountable for the governance of multiple data domains. Jonker and Petković (2014) further argued that despite the importance of this role, a definitive

method to enforce data ownership had not been identified.

Therefore the respondent sentiment that data owners was critical supports the literature and highlights that this is still an issue in the banking industry which requires a cultural shift.

6.4.2 Sponsor or Champion

Respondents felt that a data governance sponsor to champion the cause was necessary. Whilst some respondents felt that this could be one of key objectives for the emergent role of the Chief Data Officer, others insisted that this sponsorship role could be fulfilled by someone within the existing senior leadership.

In section 2.5.1, Wende and Otto (2007) suggest the need for a senior person within the organisation to oversee and fund data governance initiatives. This role is perceived critical to in ensuring that data governance receives adequate cloud and is taken seriously.

As such, the findings from the interviews support literature as they advocate for an executive sponsor to drive data governance throughout the organisation.

6.4.3 Emergent Roles – Chief Data Officer

The respondents provided varied views on the CDO role. The data consumers and consultant respondents generally felt that the role was required to help banks navigate the governance of data and champion change towards recognition of data as a strategic asset. However, most of the SMEs and data creators felt that this role whilst might be temporarily required to escalate cultural change in how banks deal with data, it was not necessarily a silver bullet.

According to Andriole (2015) and Hagmann (2013) the well-entrenched role of the CIO has always had a strong focus on governance of the technology stack within an organisation as opposed to the actual data held within systems. The rising strategic focus on data demands that someone at a senior level drives the agenda with regards to not only the governance of this strategic asset but the ability to leverage its ability to and generate revenues.

The findings support literature in so far as the need for a senior executive to champion such initiatives. However, the findings contradict literature in that some respondents felt that the role of the CDO was not necessary to mobilise data governance as this could be achieved by other existing senior executives.

6.4.4 Summary of Research Question 3 Discussion

The data owner role was identified as the most crucial role in both literature and based on discussions with respondents. Respondents furthermore emphasised that it was important to ensure that this ownership firmly recites with business and not IT.

A data governance sponsor was also identified as a key role to set strategic direction for all related initiatives. Whilst some respondents felt that this role could be fulfilled by an existing senior executive, others hypothesised that this could potentially explain why the CDO role was created.

The findings in so far as the data owner and sponsor are concerned support literature, however, findings in relation to the CDO mixed and to a large extend contradict literature.

6.5 **Research Questions 4: Data Governance Accountability**

Khatri and Brown (2010), Kooper et al. (2011) and Weber et al. (2009) all concurred that assigning responsibility and accountability to key roles was pivotal to data governance. Furthermore Hagmann (2013) insisted that the locus of control and accountability for data governance should be with business and not IT. However, Kooper et al. (2011) suggested a broader allocation of accountability that involves creators, consumers and governance individuals which suggests a far reaching allocation of responsibility within the organisation.

Respondents interviewed all agreed that accountability for data governance cannot be the responsibility of one person but rather that everyone within the organisation should be accountable. This finding in closely aligned to the views expressed by Kooper et al. (2011), which basically broaden the reach and accountability for data governance within the organisation. Based on the literature and the findings it can be inferred that for data rich organisations such as banks, the accountability would fall on everyone to ensure that their interaction with an organisational data preserves its quality.

Respondents also highlighted that existing data quality issues within banks could be associated with the need for roles such as the CDO which they felt would only be responsible for providing an oversight function and playing a sponsorship role. They however strongly expressed that the execution of data governance should still be driven by business; who should hold everyone accountability according to their role. This is consistent with literature as related in section 2.5.2 in which Ebbage (2014) suggested that the CDO should oversee data governance.

6.5.1 Summary of Research Question 4 Discussion

The consensus from the respondents was that there was no one specific role that could be held accountable for data governance. Whilst the respondents identified critical roles that were required to drive data governance as outlined in research question 2, it was evident that each of these roles was to be held equally accountable for their deliverables pertaining to data governance. Some went as far as stating that everyone with the bank was accountable for data governance as data was such a strategic asset.

These findings support literature as for each of the frameworks explored in chapter 2 as part of the literature, there were clear indicators of what each role was accountable for as part of the broader data governance program.

6.6 **Research Question 5: Factors that Enable Data Governance**

Research question 5 was formulated to further explore identified data governance enablers by Tallon et al. (2013) based on their framework in figure 3 of the literature within the banking industry.

6.6.1 Data Ownership

Respondents across all groups interviewed placed emphasis on data ownership as an data governance enabler. They felt that without identification of appropriate data owners responsible for making decision on the governance of data assets within their domain, any other activity initiated would not likely succeed.

In contrast, Tallon et al. (2013) viewed data ownership as a component of data governance critical to execution. This perhaps highlights the pivotal role data

ownership plays such that respondents felt that the absence currently inhibits data governance uptake in banks. The same can be inferred of other components; however the impact might not be as strong as in the case of data ownership.
Therefore it can be concluded that the findings add on to literature as respondents implied the absence or presence of some

6.6.2 Information Growth Rate

Respondents referred to the growth rate of data within the context of discussing data as a strategic asset. During the interview process it became apparent that while respondents agreed that the availability of massive amounts of data was a competitive advantage provided it could be leveraged for insights. However, respondents felt that the variety of data now available to banks presented a challenge in so far as governance. To this end they also felt that even current regulation could not keep up with the changes in volume and variety of data and thus was unable to appropriate define regulation in this area.

Converse to this, Tallon et al. (2013) felt that it is as a result of this rapid growth that organisation embarked on data governance related initiatives. Malik (2013) on the other hand was resolute that these volumes posed a challenge governance programmes.

As such the findings contradict a pure classification of information growth rate as an data governance enabler per Tallon et al. (2013). However as per Malik (2013) while there is recognition that volumes of data present a solid business case for leveraging data strategically given that it is well governed, the challenge in terms of how that is achieved cannot be discarded.

6.6.2.1 Data Related Business Trends

In section 5.8.2.1, respondents recognised the impact current data related trends such as digitisation, analytics and big data had in advocacy for data governance. As such they identified these trends as an enabler and part of the reason why banks currently recognise data as a strategic asset that requires governance. However, respondents also felt that these were not currently the main business drivers for data governance in the banking industry as regulation and compliance were still the instigator for such

initiatives.

Whilst the framework presented by Tallon et al. (2013) does not explicitly highlight these data trends as a factor in their model, literature is rife with the impact these trends; positively in that they data and the governance therefore to the fore-front of discussion and perhaps negatively in terms of how they have highlighted a need to re-evaluate existing policy and governance over data (McNeely & Hahm, 2014; Wamba, Akter, Edwards, Chopin & Gnanzou, 2015).

6.6.3 Organisation Strategy

Respondents agreed that strategic placement and alignment of data governance to key organisational objectives. They further elaborated that this would help employees understand how it fits into the broader picture; that improved data quality will lead to better decision making. The respondents focus on alignment to strategic objectives is in line with Hagmann (2013) who argued for positioning data governance with business to ensure that it gets prioritised as senior level in line with key objectives.

Consistent with Bharadwaj et al. (2013), respondents emphasised that IT strategy in so far a cost implications associated with data governance technology be aligned to key objectives such as data quality; thus ensuring strategic investment in technology. Thus the findings align to the literature specifically on alignment between organisational and IT strategies.

6.6.4 Organisation Structure

Weber et al. (2009) and Otto (2011) argued that the prevailing organisational structure had an impact of the chosen data governance framework; thus indicating that this was crucial in determining key roles and allocating accountability. Conversely Tallon (2013) advocated for a centralised structure which he felt aided data governance execution. However Korhonen et al. (2014) suggested that regardless of the organisational structure, data governance roles and accountability should be evident at all levels.

In general respondents concurred with literature in so far as identifying organisational structure as a key factor in data governance. A significant number of respondents alluded to traditional business unit silos that exist within banks as a challenge that should be address to ensure alignment and success in data governance execution.

This was in line with Tallon (2013) who advocated for centralisation. However there were views amongst some of the respondents that responsibility should be cascaded to all business units which supports the stance taken by (Korhonen et al., 2014) and contradicts Tallon (2013).

6.6.5 Industry Regulation

Respondents provided varied views on whether industry regulation was an enabler or inhibitor with regards to data governance. Those that concurred with this outlook cited prevailing banking industry regulation that necessitated focus on data governance. As such they agreed that industry regulation is still the main driver of data governance in most banks. They further indicated that these regulations pushed for an integrated enterprise view of data which cuts across all the previously silo business units which in itself is a data governance objective.

However, other respondents felt that regulation changed so frequently that it actually hindered data governance execution as most banks end up implementing less efficient solution in chase of regulatory deadlines. Furthermore, they felt that the regulators were challenged by the pervasiveness of data and how to regulate it and warned that some of the governance controls banks were trying to implement to meet regulation may hinder the ability to leverage data as a strategic asset.

The findings from respondents who considered industry regulation an enabler support literature stipulated in section 2.7.4 in which both Weber et al. (2009) and Delbaere (2007) concurred that such regulations mandated institution of data governance solutions within the industries they applied to.

6.6.6 Investment

Respondents indicated a need for investment to execute data governance. They felt that unless banks started making the necessary investment towards data governance, they would not be able to achieve it. Furthermore, they expressed the importance of ensuring that these investments were allocated efficiently and are aligned strategically. This was specifically in relation to technology due to the rate at which it changes.

Investment thus adds to the body of knowledge on factors that affect data governance. It further supports literature discussed regarding strategic alignment and cost reduction

objective as per Tallon et al. (2013) and Khatri and Brown (2010). Investment in data governance would drive cost reduction due to data quality issues and disparate systems.

6.6.7 New Technology

Tallon et al. (2013) indicated the role of technology in data governance as part of its composition. Respondents took this further and indicated that using technology to execute data governance would ensure its ability to scale as it would not be as mandane and be viewed as just a check list exercise.

However, some respondents were still adament that despite the capabilty technology provides, it was not a necessarity for data governance execution. Furthermore, the were other views expressed that the rate at which this new technology changes actually hinders uptake of data governance.

These findings therefore add to literature as they highlight new technology specifically as a factor that influences data governance. Similaryly to other factors discussed, there does not seem to be consensus as to whether this factor should be classified as an enabler or an inhibitor.

6.6.8 Summary of Research Question 5 Discussion

The factors discussed in this chapter relate to literature; specifically evaluating the enablers identified by Tallon et al. (2013) in their model. Based on the results stated in chapter 5 and relating that to literature, there does not seem to be a definitive answer as to whether these factors can be classified purely as enablers. Thus this adds to the literature by suggesting that whilst these are factors that impact data governance their classification as enablers is subjective and will depend on both the internal and external environment.

Furthermore, adding to the model proposed by Tallon et al. (2013), this research suggests investment and new technology as additional factors.

6.7 **Research Question 6: Factors that Inhibit Data Governance**

In a similar manner to research question 5, question 6 was posed to respondents in order to validate the inhibitors identified by Weber et al. (2009) in section 2.8 of the literature within the banking industry.

6.7.1 Legacy Systems

The literature review in section 2.8.1 indicated that legacy systems presented an issue because organisations were not fully aware of all the critical sources of data used to make business decisions (Khatri and Brown, 2010) which brings to question whether they are able to ensure appropriate governance controls over key data. The issue is further exasperated by data quality and integrity issues associated with data governance (Murtaza, 1998). Regardless of this, Madni and Sievers (2014) were adamant that legacy systems were a source valuable data which was an asset.

SME and data creator respondents discussed the challenge presented by legacy systems accumulated over the years when it comes to data governance in section 5.9.1. They did however feel that this challenged could be addressed through identification of golden sources of data to abstract data and the governance thereof from such systems which could then render them a non-issue. As such legacy systems could be a data governance enabler.

Therefore the results from the respondents contradict literature as they imply that whilst the existence of legacy systems is an issue, it presents an opportunity to embark on integration initiatives that will enable data governance.

6.7.2 Product Complexity

The paradox between designing competitive products which by nature tend to be complex and the need to maintain data quality standards pertaining to such products is outlined in section 2.8.2. To this end, Tallon (2013) argued that this presented issues for data governance efforts. However, Otto (2011) argued that there were other factors at play and that the impact of product complexity on data governance cannot be determined in isolation.

Whilst SME respondents agreed that product complexity can be seen as an issue, they

also indicated that the competitive advantage potential of governed data would advocate for business buy-in.

The findings from section 5.9.2 therefore support literature, especially the stance the effect of product complexity on the institution of data governance depends on other factors within the organisational environment (Otto, (2011).

6.7.3 Organisational Culture

Culture was mentioned repeatedly by respondents as a prevailing inhibitor to data governance in banks currently. Respondents were resolute that a cultural shift was required to propel the uptake of data governance in banks. Their views supported Hofstede (1989) as he argued that the influence of culture in organisations could no longer be avoided.

Respondents specifically felt that linking data governance objectives to employee incentives and addressing any dynamics that might exist would aid the organisational culture change required. This supports Cummings and Worley (2015) and Will (2015) who whilst acknowledge how difficult cultural change is to achieve refer to understanding the pervasiveness of values within the organisation and ensuring a win-win situation by incentivising behaviour that advocates the desired cultural change.

Whilst some respondents felt that this cultural shift was already in progress, others indicated that it does not yet exists. These finding do not dispute that culture affects data governance which aligns to Tallon (2013). However, they also highlight that currently prevailing culture will either drive the data governance agenda or hinder it and thus only after evaluation and finding that a cultural change is required can this be classified as an inhibitor. This aspect therefore contradicts the distinct classification of culture as an inhibitor by Tallon (2013).

6.7.4 Data Governance Execution Approach

There was strong emphasis made by respondents that whilst it might be relatively easier to define the standards and controls needed for data governance, the execution thereof was still a challenge. Respondents mostly associated this challenge to attempts

by most banks to implement data governance in one big project as opposed to following an incremental approach. Furthermore, they warned against initiating data governance projects that were not executed as part of solving or exploiting existing business problems or opportunities respectively.

Although not highlighted as a factor in itself by Tallon (2013), Korhonen et al. (2014) specifically mentioned assigning accountability for data governance at all levels of the organisation aligned to strategic objectives which should then cascade downwards to tactical, operational and day to day implementation. They suggested that this would therefore ensure a better execution success rate. Thus, these findings add to the factors identified by Tallon (2013).

6.7.5 Economic Conditions

Respondents mentioned prevailing economic conditions as another factor indicating the difficulty in motivating for data governance initiatives during tough economic conditions. However, they also felt that during difficult economic conditions, banks are forced to design product solutions that will enhance their competitive advantage and therefore given insights into the orientation of these designs by data analytics can advocate the need for data governance.

This is in line with Otto (2011) and Panian (2010), who suggest a link between data governance and unlocking competitive advantage through data that is of good quality. The findings further add economic conditions as an additional factor to those identified by Tallon (2013).

6.7.6 Summary of Research Question 6 Discussion

The factors discussed in this chapter are structured in light of the data governance inhibitors identified by (Tallon et al. 2013).

Similarly to the enablers discussed in the previous section, the results stated in chapter 5 vary in the assignment of these factors as enablers or inhibitors. As such, the results of this research question add to the literature and suggest that the classification of these factors also depend on prevailing conditions affecting the organisation.

Furthermore, adding to the model proposed by Tallon et al. (2013), this research suggests data governance execution approach and economic conditions as further factors.

6.8 Summary of Discussion

Table 3 below depicts an updated code book using the literature code book initially developed (see Appendix 4) as a foundation and additionally incorporating the research findings based on new codes identified.

Table 3: Updated Code Book

Research Questions	Main Codes	Sub-Codes
Research Question 1 - Data Governance components	DG Components	People
		Process
		Technology
Research Question 2 - DG Components	Data - Strategic Asset	Data Quality
		Data Security
	Firm Performance	Customer Service
		Revenue Growth
	Risk Mitigation	Regulation
		Data lifecylce requirements
	Cost Reduction	
	**Enterprise Integration	
Research Question 3 - Data Governance Roles	DG Roles	
Research Question 4 - Accountability	DG Accountability	
Research Question 5 - Data Governance Enablers	**Data Ownership	
	Information Growth Rate	**Data Related Business Trends
	Organisation Strategy	
	Organisational Structure	
	Industry Regulation	
	**Investment	
	**New Technology	
Research Question 6 - Data Governance Inhibitors	Product Complexity	
	Legacy Systems	
	Culture	**People Dynamics
		**Inceptives (KPIs)
	** Data Governance Execution	
	**Economic Conditions	

7. Conclusion

This chapter firstly restates the research objectives set out in chapter 1. Secondly, it outlines concluding remarks and key findings related to the research questions posed in chapter 3 in light of the literature reviewed in chapter 2 and the results as well as discussion as per chapter 4 and 6 respectively.

7.1 Research Background and Objectives

In this section, the researcher restates the research objectives set out in chapter 1 in an attempt to validate the research question discussed throughout the rest of the report.

The objectives of this study were to determine perceptions of stakeholders in the South African banking industry with regards to the constructs that make up data governance and also the objectives they hope to achieve when executing data governance. It was determined that understanding roles applicable to data governance was essential in assigning decision making rights and accountability for different aspects of delivery.

Furthermore, based on the enablers and inhibitors identified by Tallon et al. (2013), the researcher aimed to established whether these were considered as such by stakeholders within the banking industry with the hope to discipher the reasons why banks are perceived to struggling in their attempts to institute data governance.

7.2 Findings

This section summarises the main findings based on interviews with data governance practitioners, data consumers and data governance consultants in the banking industry.

7.2.1 Data Governance Components

The researcher intended to determine the perceived components of data governance by the respondents as this would establish a foundation and provide context into further views on the subject matter.

The main finding was that respondents identified people, process and technology as

constructs that make up data governance and that was aligned to the suggested components by Tallon et al. (2013) namely; structural practices, procedural practices and relational practices

7.2.2 Data Governance Objectives

Establishing what respondents felt were the objectives they hoped to achieve through data governance was important as it set a further foundation to highlight areas of concern and opportunity that could be used to build a business case for data governance.

The main objectives identified which aligned to the literature were the ability provided by data governance to unleash leveraging data as a strategic asset through improved data quality and data security (Khatri and Brown, 2010; Kooper et al., 2011; Tallon et al., 2013). This was the strongest objective identified by respondents. This main objective was further suggested to contribute to increased firm performance and risk mitigation which aligned to (Pytlik & Myers, 2010). Furthermore, respondents identified enterprise data integration as an additional objective that could be added to the model by (Tallon et al., 2013).

7.2.3 Data Governance Roles

Respondents prioritised the identification of data owners as a crucial role in data governance. They elaborated further that without allocation of owners it would be impossible to determine decision making rights for data domains that needed governance.

Furthermore, they felt a senior role to champion and sponsor was also important in so far as data governance was concerned. There were some that felt that this could be the strategic positioning of the emergent Chief Data Officer role that is currently the hype. However, some respondents debated the need for this role as they felt existing senior executives could potentially adopt this function. Despite this view, all respondents concurred that banks had to focus their efforts in so far as data and the governance thereof were concerned.

7.2.4 Data Governance Accountability

Having established key roles associated with data governance by respondents, it was then important to determine where they felt the locus of control and accountability for data governance should fall. The consensus from respondents was that the locus of control and decision making for data governance should firmly be located with business with data owners playing a critical role.

However, there was a clear understanding that everyone should be responsible for their interactions with any organisational data and as such should be held accountable for their impact on that data and understand what the downstream impacts of their actions result in.

7.2.5 Factors that Enable Data Governance

Tallon et al. (2013) identified factors that enable data governance being:organisation strategy, organisation structure, culture, industry regulation and information growth rate. The objective of this study was to determine whether data governance stakeholders in the banking industry identified with these factors as enablers within their environment.

What was evident from their responses was that whilst they agreed that these factors influenced their ability to institute data governance, there was no conclusive evidence that they all viewed them as enablers. Their perceptions varied based on prevailing conditions at the time within the bank they operated in.

Furthermore, respondents identified two other factors namely the level of investment allocated to data governance initiatives as well as new technology. Similar to the other factors, there were mixed review on what the impact of these factors were to data goverance as an example the prevailing economic conditions would at times act as an enabler whilst at other times it would inhibit data governance initiatives.

7.2.6 Factors that Inhibit Data Governance

The discussion on data governance inhibitors also indicated that whilst (Tallon et al. 2013) had made a conclusive categorisation of inhibitors namely, product complexity,

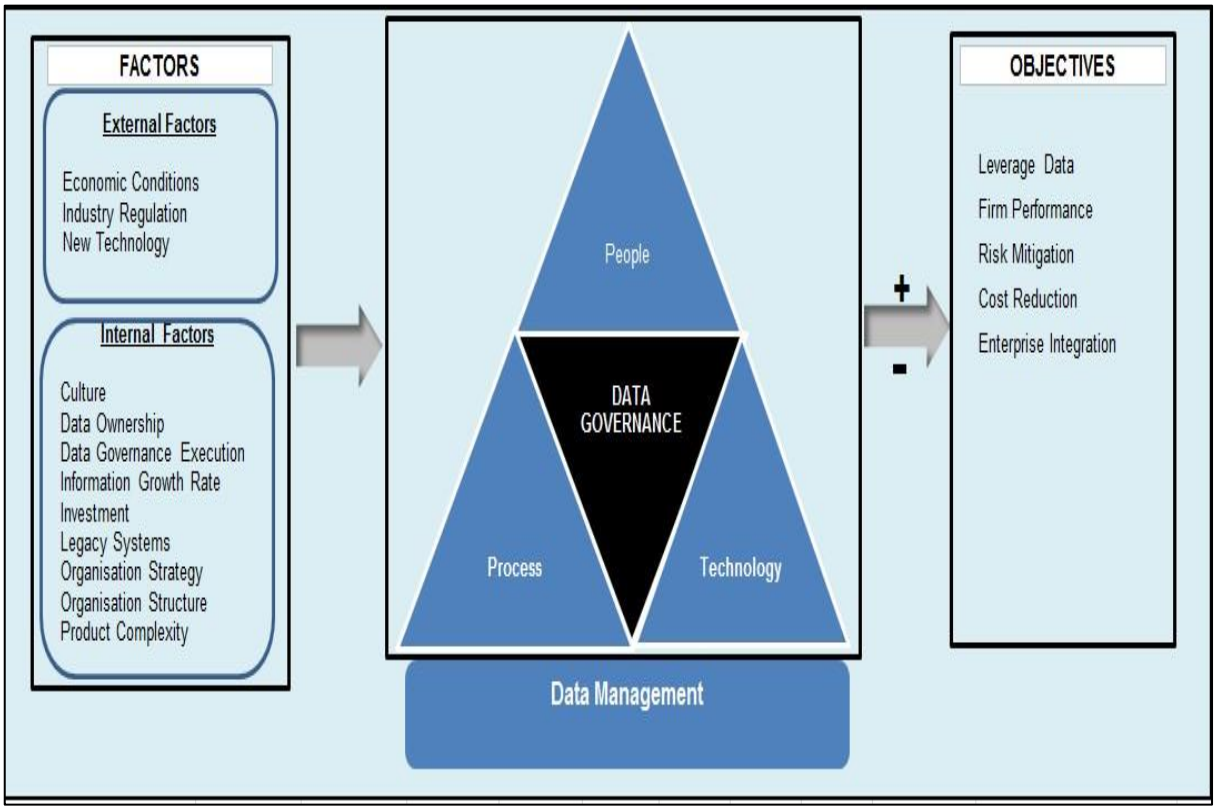
legacy systems and culture; these were viewed as factors and classified based on the current sentiment within the bank in which the respondents operated.

This therefore adds to literature as it suggests that the impact of factors on data governance differ based on sentiment and can sometimes be very subjective. Furthermore, respondents added data governance execution approach and economic conditions as additional factors to consider.

7.3 Suggested Framework for Data Governance

In light of the results and discussion outlined in chapter 5 and 6 within the context of the literature reviewed in chapter 2, the researcher proposes the framework outlined in Figure 9 below to assist the banking industry in South Africa with regards to their data governance initiatives.

Figure 8: Suggested Data Governance Framework



The framework combines that of Weber et al. (2009) in so far as the identification of generic contingencies that affected data quality management outcomes and that of Tallon et al. (2013) which contextualised these contingencies in reference to data governance and also identified the constituents and objectives. It is assumed that data governance roles and accountability form part of the people component of data governance.

Based on literature and findings from the qualitative study conducted, it would seem that there is no clear distinctive classification of factors affecting data governance as suggested by Tallon et al. (2013) as either enablers or inhibitors. However this rather seems to be a product of the prevailing interaction of these factors in each bank at a particular point in time. It can therefore be argued that these factors could oscillate between enabling and constraining the constitution of data governance. Therefore the suggested framework depicts these contingencies generically to indicate their influence on data governance and rather distinguishes between internal and external factors.

Furthermore, additional factors, namely; new technology, data ownership, economic conditions, data governance execution approach and investment were identified by respondents further adding to the literature reviewed in chapter two.

Looking at the composition of data governance, the framework depicts the constituents as people, process and technology generically and does not delve into which areas within these components should be the focus as Tallon et al. (2013) did. The rational being that based on the dominant factors affecting data governance execution at a specific point in time, the focus areas within these broad areas would change and thus the generic classification as identified by respondents in chapter 5 provides the flexibility to constantly re-evaluate and re-prioritised the main focus areas.

Although not definitively discussed in detail, it is understand from literature and respondent feedback that data governance revolves around managing the strategic asset that is data. Hence the need for such governance is founded on the existence of data management components that require governance the main one discussed being data quality as depicted in the framework. However it is assumed that this model would therefore apply equally to all other such components.

Finally, it is important that banks understand the objectives that they wish to achieve through data governance initiatives which will ensure that they are aligned to strategy. The respondent feedback received concurred with the four objectives outlined in literature; leveraging data as a strategic asset, firm performance, risk mitigation and cost reduction. A fifth objective was identified by respondents and that was the ability to integrate enterprise data. Therefore based on how these internal and external factors impact data governance, the stated objectives will either be achieved or derailed.

7.4 **Recommendations to Stakeholders**

Based on the findings, the following recommendations are proposed for the relevant data governance stakeholders within the banking industry.

7.4.1 Data Governance Practitioners

It is critical that data governance practitioners within the banking industry align any initiative undertaken to strategic objectives. Given the infancy and slow update of data governance, it is highly recommended that they high business value-add projects to align data governance to in an effort to build a solid business case going forward.

Finally, it is imperative that they evangelise the need for data governance and more importantly demonstrate the ability to execute governance that is geared towards addressing current business challenges and exploiting opportunities presented by organisational data that is adequately governed to provide insights.

7.4.2 Data Consumers

For data consumers, it is important that they continuously highlight the impact a lack of data governance has on the data they end up using to make decisions be is to exploit data for insights or for regulatory purposed. This needs to be done throughout the organisation but should start with leadership. Furthermore, they need to ensure that data owners are identified and held accountable for decision making rights pertaining to the data that originates in their business areas.

Consumers are also advised to ensure that all initiatives initiated in their business area add data governance execution as part of the project deliverables. It is hoped that this

will start transforming the culture.

7.4.3 Data Creators

Data creators are encouraged to ensure appropriate identification of data owners and ensure that this is a clear understanding throughout the bank that data ownership is the responsibility of business and not IT. That however does not imply that IT personnel cannot be held responsible for how they treat data and ensure that their systems are appropriately maintained to preserve data quality and integrity.

7.4.4 Data Governance Consultants

Data governance consultants operating in the banking industry are advised to further research how banks can explore further alignment of data governance initiatives to strategic objectives. Furthermore more, similar studies are required on organisational transformation as the current sentiment suggests that a cultural shift is required to ensure the success of data governance execution.

Consultants are further encouraged to articulate case studies pertaining to companies that have successfully managed to execute data governance. It is hoped that the practical examples and insights provided by these case studies will aid banks in their own endeavours.

7.5 **Contribution and Recommendations for Future Research**

The exploratory nature of qualitative research is such that it seeks to gain further insights in the area of study which does not necessarily result in definitive answers but indicative of further research to be done (Leedy and Ormrod, 2005).

Therefore this research paper contributes to the existing body of knowledge on data governance through further probing a small sample of stakeholders in the South African banking industry to understand their views on the components, objectives and roles as well as accountability constructs regarding this subject. Furthermore to establish their views on the proposed enablers and inhibitors of data governance as they pertain to the banking industry in South Africa.

Future research on this subject can expand of this research paper and test the

proposed framework through a quantitative study in an effort to get results that could be generalised to the entire population.

Furthermore, other areas of future research include:

- An assessment of which of the identified data governance factors are more dominant.
- Exploratory study to determine the interaction between data governance and each of the data management components.
- How prominent data governance roles further aid the advancement of data governance in organisations.
- Methods that can be used to quantify the impact data governance has on organisational performance.

7.6 Research Limitations

Research is susceptible to bias and even more so, qualitative research. This is an inherent consequence in the endeavour to probe further current understand of any area of research.

Given time restrictions in conducting the research, the researcher is well aware that the sample chosen, specifically with regards to the banks may be skewed and therefor presents a further challenge is any attempt to generalise the findings. However, given the stated time limitation and the fairly need topic of data governance that forms the basis of this research, there are fairly few people that have sufficient knowledge in this area

The researcher is aware of their bias as this is an area of personal interest conducted within an industry they currently work in. This lends itself to potential prejudice in the interpretations and conclusions of this research as the researcher may have over-emphasised certain aspects of the topic based on their personal experience regarding the subject matter.

Because of the rapid rate at which research in data related disciplines including data management and data governance specifically, the researcher is well aware that they may have missed more recent and potent literature that would have added further context and insights to this research and as such this research lends itself to further qualitative and quantitative research.

Despite all these shortcomings, the researcher beliefs the care taken in reviewing the literature and the interview process can be considered sufficient to reduce these stated biases.

7.7 Research Report Conclusion

This research paper explored data governance composition, objectives, roles, accountability, enablers and inhibitors within the banking industry in South Africa. The industry was chosen due to its data driven nature and in light of recent regulation instructions forcing the update of data governance.

The respondents were stakeholders within the banking industry and they identified people, process and technology as data governance components. The ability to leverage data as a strategic asset was identified as the cornerstone data governance objective. Linked to that were other objectives that could be achieved namely increased firm performance, reduced cost, risk mitigation and the addition of enterprise-wide data integration.

The main role identified which was considered critical to data governance was identification of data owners. In addition to that, a sponsor to champion the data governance cause was also deemed important. Whilst on the other hand there were mixed sentiments on the role of the Chief Data Officer and whether it is really needed.

In evaluating the identified factors that influence data governance, it became apparent that a simplistic classification of these factors as either enablers or inhibitors would be a difficult task as the findings indicate that this view could vary based on the current sentiment within each specific bank.

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Appendix 1: Interview Question Guide Version 1

1. How would you define data governance?
2. What are the components of data governance?
3. What are the objectives of data governance?
4. What key roles are essential for data governance?
5. Who is ultimately responsible and accountable for data governance?
6. What internal and external factors enable data governance?
7. What internal and external factors inhibit data governance?

Appendix 2: Interview Question Guide Version 2

General

- Please provide an overview of your current role and how it relates to data governance.
- How long have you worked for the organisation?
- What do you perceive the culture of the organisation towards data governance to be?

Data Governance Components and Objectives

- What are the components of data governance?
- What are the objectives of data governance?

Roles and Accountability

- What key roles are essential for data governance?
- Who is ultimately responsible and accountable for data governance?

Classification of Data Governance Contingencies

- What internal and external factors enable data governance?
- What internal and external factors inhibit data governance?

Appendix 3: Informed consent letter

Dear Sir/Madam

Thank you in advance for granting my interview request.

As partial fulfilment towards my Masters in Business Administration (MBA) at Gordon Institute of Business Science (GIBS), I am conducting research on stakeholder views on data governance decision making responsibility and accountability; as well as enablers and inhibitors of data governance in the banking industry. Our interview is expected to last about an hour, and will help us explore whether current decision making accountability, enablers and inhibitors are adequately identified and allocated for data governance within the banking industry in South Africa.

Your participation is voluntary and you can withdraw at any time without penalty. All personal data will be kept confidential. If you have any concerns, please contact me or my supervisor. Our details are provided below.

Researcher: Nthabiseng Seboka
Email: 441269@mygibs.co.za
Cellphone: +27(0) 84 350 9119

Research Supervisor: Robert Beney
Email: robbeney@gmail.com
Cellphone: +27(0) 82 333 9853

Signature of participant: _____

Date: _____

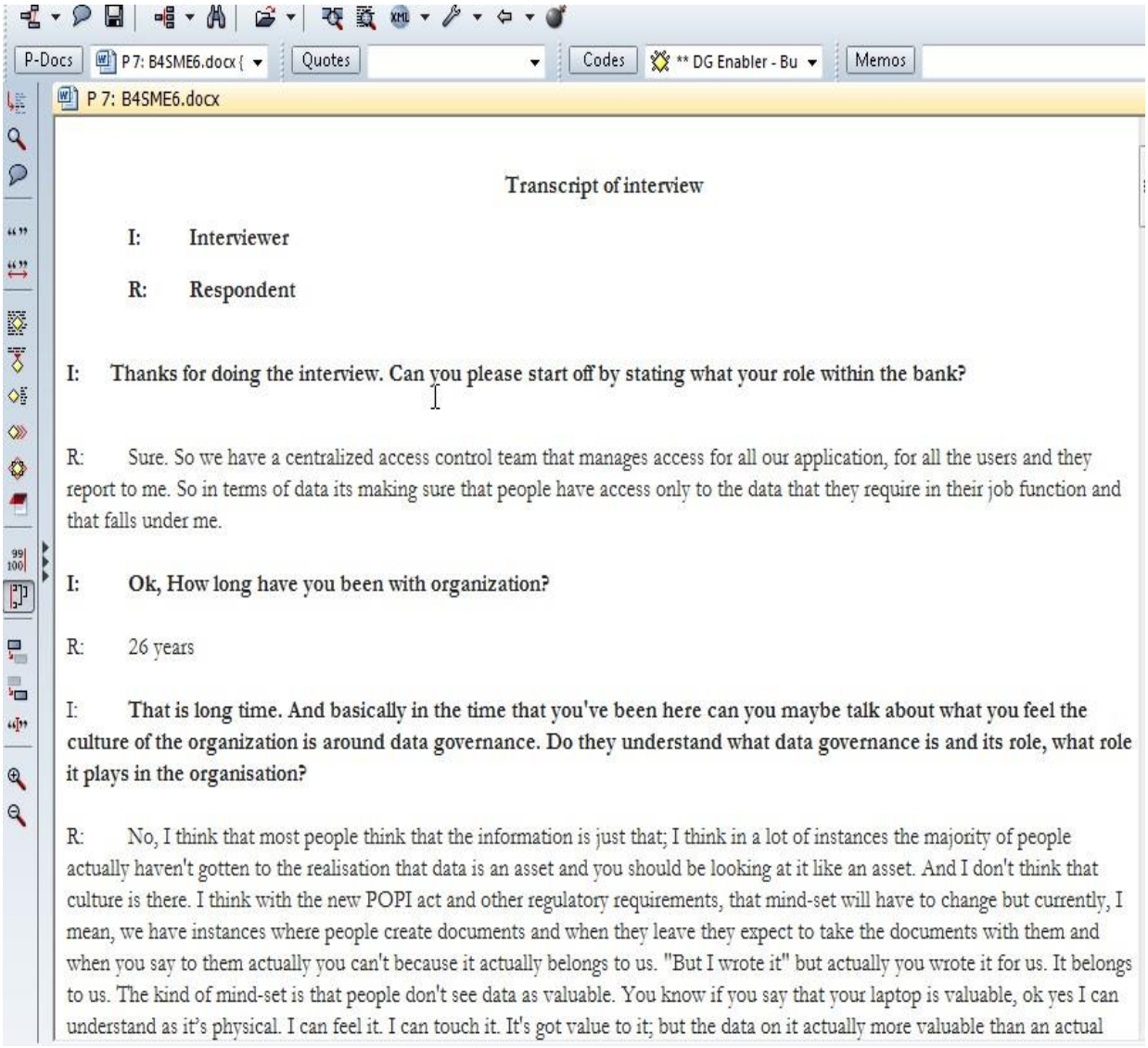
Signature of researcher: _____

Date: _____

Appendix 4: Literature Code Book

Research Questions	Main Codes	Sub-Codes
Research Question 1 - Data Governance components	DG Components	
Research Question 2 - DG Components	Data - Strategic Asset	Data Quality
		Data Security
	Firm Performance	Customer Service
		Revenue Growth
	Risk Mitigation	Regulation
		Data lifecycle requirements
	Cost Reduction	
Research Question 3 - Data Governance Roles	DG Roles	Data owner
		Sponsor
		Chief Data Officer
Research Question 4 - Accountability	DG Accountability	
Research Question 5 - Data Governance Enablers	Strategy	
	Organisational Structure	
	Industry Regulation	
Research Question 6 - Data Governance Inhibitors	Product Complexity	
	Legacy Systems	
	Culture	

Appendix 5: Sample of Transcript from Atlas ti.



Transcript of interview

I: Interviewer

R: Respondent

I: Thanks for doing the interview. Can you please start off by stating what your role within the bank?

R: Sure. So we have a centralized access control team that manages access for all our application, for all the users and they report to me. So in terms of data its making sure that people have access only to the data that they require in their job function and that falls under me.

I: Ok, How long have you been with organization?

R: 26 years

I: **That is long time. And basically in the time that you've been here can you maybe talk about what you feel the culture of the organization is around data governance. Do they understand what data governance is and its role, what role it plays in the organisation?**

R: No, I think that most people think that the information is just that; I think in a lot of instances the majority of people actually haven't gotten to the realisation that data is an asset and you should be looking at it like an asset. And I don't think that culture is there. I think with the new POPI act and other regulatory requirements, that mind-set will have to change but currently, I mean, we have instances where people create documents and when they leave they expect to take the documents with them and when you say to them actually you can't because it actually belongs to us. "But I wrote it" but actually you wrote it for us. It belongs to us. The kind of mind-set is that people don't see data as valuable. You know if you say that your laptop is valuable, ok yes I can understand as it's physical. I can feel it. I can touch it. It's got value to it; but the data on it actually more valuable than an actual

Appendix 6: Ethical Clearance Letter

Gordon Institute of Business Science
University of Pretoria

Dear Nthabiseng Setoka

Protocol Number: **Temp2015-01398**

Title: **Stakeholder views on data governance decision making responsibility, enablers and inhibitors**

Please be advised that your application for Ethical Clearance has been APPROVED.

You are therefore allowed to continue collecting your data.

We wish you everything of the best for the rest of the project.

Kind Regards,

GIBS Ethics Administrator