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TAXONOMY OF LITERATURE TO JUSTIFY DATA GOVERNANCE AS A PRE-REQUISITE FOR INFORMATION GOVERNANCE

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ABSTRACT

Due to the increased use of technology by a wider section of society, stakeholders, non-stakeholders and other informal interests can easily access an organisation's most sacred information assets. As a result of the role played in planning, information is presently regarded as a key asset of an organisation. Data forms the basis of information, which is the central, most important factor employed by organisations in fiscal and strategic planning. In spite of this, not much attention or resources is devoted to data governance. This study chronicles extant literature to justify the position that data governance should be a prerequisite for information governance within organisations. The study argues that an information governance policy which is based on inaccurate, incomplete, obsolete and fallacious data is detrimental to the organisation. The study concludes by proposing four critical success factors for data governance which will ensure that information is accurate, relevant and meets compliance standards for an organisation.

INTRODUCTION

Numerous schools of thought, including the Data Governance Institute, have consistently used Information and Data Governance interchangeably, connoting the understanding that the two terms mean the same thing. The research problem exists as a result of the focus on improving information governance rather than data governance which has led to a neglect of data governance in institutions. Additionally, a cursory examination of extant literature in information governance does not highlight the relationship between effective information governance and the correct, processed based approach to data governance in order to ensure information being governed has veracity from the source. The study seeks to address this gap in the literature, argues that there is a distinction between these two

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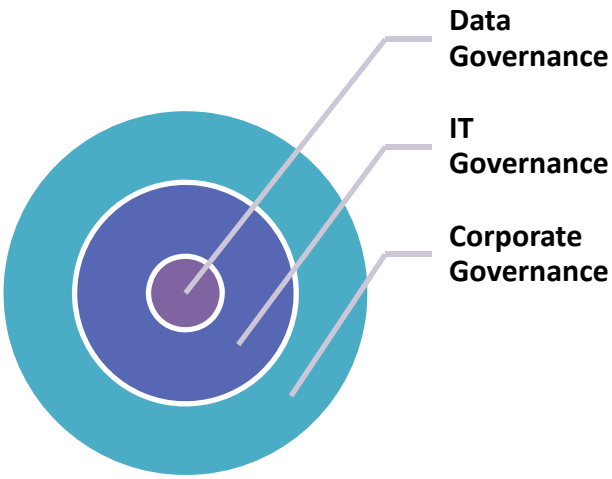
terms and proceeds to highlight literature which determines that data governance must be perceived, treated and conceived by organisations as an important component and asset if it is to meet the statutory and fiduciary requirements of information governance. We argue that a data governance nomenclature has to become an ingrained part of both corporate governance and IT governance. The diagram in Figure 1 illustrates this relationship further.

FIGURE 1
DATA GOVERNANCE PLACEMENT IN CORPORATE AND IT GOVERNANCE



Source: Informed by Soares, 2015; Thomas, 2015

Based on the diagram above, it is inferred that data governance is a subsection of IT governance which is enabled by corporate governance principles and processes for the purpose of achieving business objectives and delivering value (Soares, 2015). To this end, it is opined that the buy-in and cooperation of top management in implementing data governance processes is the best way to assure the security, management and sanctity of data in organisations (ISACA, 2013). Furthering the argument, Olaitan and Flowerday (2016), in agreement with Saetang and Haider (2012) state that in the corporate world where there is fierce competition, IT governance has the capability, tools and processes to support business strategy in practical, applicable ways. Four critical success factors were thereafter proposed for data governance to deliver maximum value to information governance in an organisation.

RESEARCH OBJECTIVE

The objective of this study is to present an argument for data governance as a prerequisite for information governance based on a taxonomy of extant literature, thereafter proposing a set of critical success factors deemed necessary in order for data governance to deliver maximum value to information governance in an organisation. The study argues that a sound and effective information governance culture cannot be in place within an organisation without due attention being paid to how data is managed internally and the effect of ungoverned data on information governance. The methodology followed is discussed in the next section of this study.

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METHODOLOGY

This study argues for the justification of data governance as a prerequisite for information governance in organisations. The objective of the study is to outline a taxonomy of relevant, recent literature to justify the necessity for data governance if an organisation is to be able to meet its regulatory, compliance and strategic management needs. This research is exploratory and qualitative in nature, this is because the findings presented were derived from extant literature. The method employed was a combination of content analysis and thematic selection of relevant literature from the data governance and information governance domain. A content analysis of mainly information governance and data governance articles was done using the recommended steps in the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) statement (Moher, Liberati, Tetzalaff, Altman, PRISMA Group, 2009). This was considered expedient in order to expound a sound theoretical foundation for the study. The PRISMA statement is used to contextualise and detail the approach by which authors chose the contents that were relevant for a study and how these were employed in order to reach a scientific conclusion.

The PRISMA statement was originally developed for the reporting and writing of medical reviews in the United Kingdom (Moher, et al., 2009). It was considered essential that a researcher should have a set of processes or procedures that were followed in undergoing a systematic review which can be verified or validated scientifically. It is opined that the conduct and successful outcome of a systematic review depends, to a large extent, on the scope and quality of the literature included in the study.

The relevance of the PRISMA statement to this study is that it serves to underpin the steps used by the researcher to undergo a systematic review of the literature and thereafter sets the rationale for the conclusion reached in the study. The study examines a taxonomy of extant literature to justify the argument that data governance should ideally be a prerequisite for information governance if organisations are to report uniform views on their business both for compliance and decision making purposes. Since the completion of a literature review is an iterative process, this study employs the PRISMA statement to ensure that sound principles are followed and the outcome can be validated. A content analysis of recent and relevant literature is carried out, after which a conclusion is drawn to summarise the position of this study. Four critical success factors were thereafter presented for the purpose of ensuring that data governance assures the accuracy and relevance of information within organisations. The PRISMA statement for the purpose of this study is diagrammed in Figure 2 below;

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FIGURE 2
PRISMA STATEMENT

(Informed by Moher, et al, 2009)

From the PRISMA statement diagrammed above, the process of selecting the articles that were reviewed for the purpose of this study is clearly outlined. The next section of the study discusses the content analysis methodology employed by the study.

Content analysis

Content analysis refers to a method for systematically exploring textual data to identify the patterns and structures in it, with the intention of identifying the important features of a given construct (Billore, Billore, and Yamaji, 2013). This systematic data exploration was the methodology employed in deciphering meanings and drawing inferences which led to the conclusion for this study. Vitouladiti, (2014) contends that this allows an author to reach a conclusion with a certain degree of scientific precision. The conclusions were drawn by using the six steps of content analysis as outlined by Krippendorff (2013). The following steps are involved:

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- **Unitising** – As outlined in the PRISMA statement, text and content relevant to the subject of data governance and information governance were critically selected and reviewed for the study.
- **Sampling** – Although the search on EBSCOHOST and Google Scholar returned 4845 and 2100+ respectively, the study only reviewed a total of 29 articles as they were considered the most relevant and current literature in the area of data governance and information governance. The aforementioned databases were specifically chosen for this study as they represent the two most comprehensive and inclusive databases for current research in the IT governance and management domains.
- The sampling and selection process was based on frequency of citation, relevance of empirical literature in articles which validates the line of argument of this paper and the focus on recent regulatory laws which puts data and information governance at the centre of compliance. The 29 articles reviewed were chosen as they discussed both subject matters (information and data governance) exhaustively and presented new knowledge on the managerial implications of the field of study.
- **Coding** – Involves grouping similar themes and contexts together into the same units of analysis in order to deduce meaning. This study carries out this step by discussing the motivation for data as a prerequisite for information governance by grouping the different layers of data governance and information governance; its relevance and criticality to business and IT process in related contexts.
- **Reducing** – In a qualitative study of this nature, the findings are grouped in concepts rather than units of measure. The segmentation of the stratified data assisted the researchers in reaching the conclusion of the study; that data governance is pivotal to the achievement of information governance and compliance.
- **Inferring** –Inferences were drawn in the conclusion based on the works of several authors that were quoted in the reviewed extant literature. These inferences represent a unit of opinion amongst the wide spectrum of authors in this domain. The conclusion is therefore considered as valid and generalisable.
- **Narrating** – The final step involves writing up the results of the preceding five steps in a way that answers the research question at hand. The narrative stage must ensure that the inferences drawn from the data are outlined in concise, clear language that directly addresses the research question. In this study, the narration is done by drawing conclusions based on the review of literature (Krippendorff, 2013).

The next section discusses the dichotomies between these two terms as this distinction will help to put the problem being addressed by this study into clearer perspective.

LITERATURE REVIEW

Dichotomy between Information Governance and Data Governance

There is empirical evidence to show that the definition and use of the two terms namely information governance and data governance are different, the processes and drivers for each of the terms distinct (Deloitte, 2009). Information Governance is defined as "the specification of decision rights and an accountability framework to ensure appropriate behavior in the valuation, creation, storage, use, archiving and deletion of information (Gartner, 2016). This includes the processes, roles and policies, standards and metrics that ensure the effective and efficient use of information in enabling an organization to achieve its goals" (Gartner, 2016, p. 1). Condensing this definition, Smallwood (2014, p. 2) states that "Information governance is policy-based control of information to meet all legal, regulatory, risk, and business demands". Likewise, the Information Governance Initiative describes Information governance as the activities and technologies that organisations employ to maximise the value of their information while minimising associated risks and costs (Information Governance Initiative, 2016). It is noteworthy that these three definitions of Information Governance do not focus on data capture or data quality processes; rather on controlling and managing the processed information

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to maximise its value and minimise the risks organisations may face by the misuse, theft or loss of its information assets.

Data Governance, on the other hand, encompasses processes and controls to ensure that information at the data level, raw alphanumeric characters being captured and imputed into a database are true, accurate, auditable and not redundant (Smallwood, 2014). Some of the activities encompassing data governance include; data identification, data quality management, metadata management, data storage data cleansing and data archiving (Berson and Dubov, 2011; Khatri and Brown, 2010; Huner, Ofner and Boris, 2009). The focus of data governance is the quality of information from the root. Legal, compliance and regulatory requirements necessitate that data which forms the basis of information is relevant, correct and trustworthy. Data governance is at the most rudimentary level of information governance as it seeks to ensure that formal management controls are in in place to govern critical data assets (Steinhart, 2010). The consequence of poor data is false, outdated or inaccurate information which ultimately results in inaccurate and erroneous plans and decisions (Eckerson, 2014). To extend this notion further, it can be said that information comprises of data that has been put in context, and the context arrived at depends entirely on the raw data used in the exercise.

We state that while information governance consists of the policies and processes to maximally leverage data, meet its legal and compliance obligations and minimise and mitigate the risks associated with information assets, data governance is the embodiment of the processes, methods, tools and techniques to ensure that the organisation has data that is of high quality, reliable and auditable (Korhonen, Melleri, Hiekkanen, and Helenius, 2013; Smallwood, 2014; Redman, 2008; IT Governance Institute, 2005). Table 1 below summarises the key differences in the two terms.

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TABLE 1
DICHOTOMY BETWEEN INFORMATION GOVERNANCE AND DATA GOVERNANCE

Information Governance	**Data Governance**
Focus Area	Focus Area
Appropriate use of information: who should or should not use organisation's information	Data Quality: What rules can be strategically applied for the capturing, measurement and monitoring of data
Business Value: is maximum value being derived from the intelligence or context generated from the data.	Data Transparency: Content, location and security of organisation's data
Information Lifecycle: The control, discovery, and retention of data while ensuring privacy and collaboration	Data Lineage and Management: System for recording various data sets, consistency in notational entries and common language for data
Information Ownership: Clear definition of process ownerships for the creation and maintenance of varying kinds of information.	Data Security/ Ownership: How to secure data in spite of whatever platform it is on, accountability rights for the maintenance and storage of data assets
Key Drivers	**Key Drivers**
Legal and compliance requirements	Maximising the income generation potential of data
Optimised discovery of the organisation's potential	Increasing consistency and confidence in corporate decision making
Privacy and security	Improving data security and quality
Productivity and collaboration	Optimised staff effectiveness
Defensible disposition	Establish process performance baselines to enable data improvement efforts
Key Issues Addressed	**Key Issues Addressed**
Location of records, verification of management, decisions on what record to keep and for what length of time	How to leverage the vast amount of data and other applications available in databases to make better decisions for the organisation.
Identification and management of the latest and most relevant version of documents.	How to address the issue of duplicate data across different platforms and applications and ensure data integration.
Maximisation of employee productivity through collaboration across business units and minimising losses during employee turnover.	How to ensure the management, completeness and validity of data.
Ways and means of controlling documents and electronic information in case of litigation	How to keep critical and financial data secure
Location of privacy information across all repositories and how to take control of the information.	The control and assurance of privacy data in between applications.

Source: Informed by Soares (2015) John Schmidt (2014) and Smallwood (2014)

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In light of the foregoing distinction, the next section of the study now discusses the importance of information with relation to corporate governance and IT governance.

Corporate Governance

Globally, a number of events have prompted a set of guidelines and compliance legislature as to how information should be handled, disseminated and stored by both private and public organisations (Rossouw and van Vuuren, 2013). Some of the most notable of these global developments include the financial meltdown of the 1990s, which saw major corporations such as Enron, WorldCom and a host of others declare bankruptcy soon after presenting healthy audited financial reports to regulatory authorities in their respective countries (Ammann, et al., 2011). Another notable development is the prioritisation of corporate governance in most countries (Bahrman, 2011). The continued incursion of technological innovations has made the entire world a global village and stakeholders are easily able to access, question and openly critique the way an organisation is being governed (Bahrman, 2011). It therefore became pertinent for directors and corporate gatekeepers to ensure they have the ability to safeguard the critical information assets of their organisation. Corporate governance provides the structure through which the organisation's objectives are set, and the means of attaining those objectives and monitoring performance are determined. The OECD stated in the 2015 updated version of the Principles of Corporate Governance that "Users of financial information and market participants need information on reasonably foreseeable material risks that may include: risks that are specific to the industry or the geographical areas in which the company operates; dependence on commodities; financial market risks including interest rate or currency risk; risk related to derivatives and off-balance sheet transactions; business conduct risks; and risks related to the environment" (OECD, 2015, p. 46).

In the South African context, the most prominent source of guidance with regards to effective corporate governance for organisations is the King Code. The Institute of Directors (IoD) describes corporate governance as the structure through which organisations are 'directed, controlled and held accountable' (IoD, 2015). The King Code of corporate governance details the expectations and responsibilities of business leaders across all corporate bodies in South Africa. The framework of rights, responsibilities, procedures and relationships amongst stakeholders within an organisation is defined by its corporate governance structure. The IoDSA (2016) submits that good governance is essentially about effective leadership. Leaders have a fiduciary duty to define strategy, and to provide the direction for the ethics and values that guide business practices in a positively sustainable way (IoDSA, 2016). However, for the purpose of this study, corporate governance is defined as "the set of responsibilities and practices exercised by the board and executive management in providing strategic direction, ensuring that objectives are achieved, ascertaining that risks are properly managed and verifying that the organisation's resources are used responsibly" (IT Governance Institute, 2005, p. 23).

IT Governance

The King III code introduced a section on IT governance (IoDSA, 2016). The section details IT governance issues and adapts a 'comply or explain' stance to directors' handling of information assets. The recently released draft of King IV code has separated information from technology, with a view that information is a critical asset for organisations in its own right (IoDSA, 2016). The code now requires that executives have a set of governance processes in place to safeguard, control and enhance information (IoDSA, 2016). The Companies Act of 2002 further reinforces the importance of accurate information as an auditable asset of the organisation.

One of the significant outcomes of corporate governance regulations such as the Companies Act (South Africa) and the Sarbanes- Oxley Act (USA) is the audit and compliance requirements which

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organisations are expected to fulfil. All of these compliance reports involve several layers of data which must be consistent and accurate (Salido, 2010). The domain of IT governance encompasses the use of technology for driving compliance processes in the organisation (Olaitan and Flowerday, 2016). Additionally, due to the easy access of information via the web, clients, customers and several stakeholders currently interact with businesses more directly than what obtained in past decades (Iyamu, 2011). Organisations therefore need to ensure they manage data in a manner that correspondents with the values and missions they profess to their stakeholders. The era of tweets, newsfeed and all associated social media has forced management of organisations to entrench a culture of care in the way information is managed and processed (Huner, *et al.*, 2009). In the context of how important information has become therefore, this study opines that there is a huge risk of basing corporate information on fallacious or incorrect data due to a lack of governance of data from the roots.

In the same vein, IT governance forms a pivotal component of corporate governance. This has become even more important as technology use has become a daily part of an organisation's process enablers. According to the IT governance Institute, IT governance is "set of responsibilities and practices exercised by the board and executive management with the goal of providing strategic direction, ensuring that objectives are achieved, ascertaining that risks are managed appropriately and verifying that the organisation's resources are used responsibly." (IT Governance Institute, 2005 p.23). This lengthy definition is summarised by Gartner (2016), who described IT governance as the processes that ensure the effective and efficient use of IT for enabling organisations to meet their business goals (Gartner, 2016). Also, the King III Report defines IT governance as "a framework that supports effective and efficient management of IT resources to facilitate the achievement of an organisation's strategic objective (IoDSA, 2016, p. 52). All the definitions examined have alluded to the crucial role played by board and executive management of organisations in ensuring that IT assets are protected, risks are minimised and resources of the organisations are put to effective and efficient use through the governance of IT. Furthermore, the accessibility of the Internet to millions of people worldwide has also introduced new business models and a more inclusive role for shareholders and stakeholders in an organisation (Eckerson , 2014). Unfortunately, this ease of access has also introduced enormous IT risks such as data theft, hacking, loss of critical information and loss of critical output hours effected by failure of IT artefacts (Hardy, 2006).

Information Governance

The importance of information to applications is dependent on the data input for the system to process into useful and usable information assets for the organisation (Eckerson, 2014). In essence, data encapsulates all the processes expected of information. For information to effectively behave as expected, the placement of data within the IT system is outlined below:

- Applications are in place to process data supplied by users and/or other applications
- Data is the life breath of the application as it enables and empowers it to become meaningful
- Infrastructure manages and stores both hardware and software data assets
- The output, which is the information the organisation derives from the IT system is dependent on the quality of data input into the IT system, thus imposing significant responsibilities on organisations to manage data as a key strategic asset (Soares, 2015; McSweeney, 2010; Khatri and Brown, 2010).

From the foregoing, it is evident that data is at the root of the information delivered by the IT systems in an organisation. Soares (2015) and Iyamu (2011), states that it is critical for information to be valued as an asset, leveraged across the information value chain to enhance competitive advantage and accelerate decision making in the organisation. Additionally, given the convergence of workplace functions across different business units, information has to be shared in a manner that maximises effective decision making throughout the organisation. External partners and stakeholders and even

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public interests must be served in an efficient manner. Thus, it is important that the information value chain ensures the security, management and relevance of information being processed throughout the organisation (Soares, 2015; Kushner and Villar, 2008). This positioning of information in the organisational value chain necessitates that data governance is considered as a prerequisite of information governance within the ambit of the functional role of information in the organisation. Furthermore, organisations are beginning to realise the importance of trusted data for leveraging information effectively in order to gain better insight into consumer needs, design innovative solutions and meet strict compliance regulations (Alles and Piechocki, 2012; Weber, Otto, and Osterle, 2009).

In spite of the aforementioned, most organisations still focus on information governance with only heuristic consideration for the factuality of the information contents (Lucassen and Schraagen, 2011). This in itself presents a risk in an era where legislation and other legal requirements are binding on the directors and leaders of organisations. Research has shown that only 15% of Chief Information Officers (CIOs) believe that their data is currently comprehensively and professionally managed, while 78% are keen to improve upon the way organisational data is used and managed (McSweeney, 2010). A staggering 42% of senior managers make use of wrong information once a week while 52% miss information they could have used to better position the organisation. The study also shows that 52% of users do not have confidence in the information available in their organisation while 75% of CIOs believe they can strengthen their competitive advantage by better managing the organisation's data (McSweeney, 2010). Information security governance is discussed in the next section as it forms an important aspect of information governance.

Information Security Governance

Extant literature has defined the function of Information Security Governance as consisting of management commitment and leadership, organisational structures, user awareness and commitment, policies, procedures, processes, technologies and compliance enforcement mechanisms, all working together to ensure that the Confidentiality, Integrity and Availability (CIA) of the organisation's electronic assets (data, information, software, hardware, people, etc.) are maintained at all times" (Von Solms and Von Solms, 2005, p. 3). In consideration of the CIA described in this definition, this study portends that data governance is at the root of ensuring these three attributes are in place for management to be assured that they are reporting a correct view of the organisation's position (Lucassen and Schraagen, 2011; Von Solms and Von Solms, 2005). In light of the crucial role played by data in assuring the CIA therefore, the study proceeds to a discussion of the challenges of information governance and thereafter discusses the place of data governance in positioning the organisation for effective information governance.

Challenges of Information Governance

Information remains one of the most valued organisational assets in a knowledge economy (NASCIO, 2008). Data is restructured to produce information, which in turn produces knowledge. This knowledge thereafter becomes the rationale for the wisdom, and background for decision making (NASCIO, 2008). Information is also a critical asset in transformation economies such as obtains in Africa (Ifinedo, 2011). The positive performance of government and measureable value creation for its citizens depends to a large extent on how information is formed, distributed and shared across functional units of government (Sarsfield, 2009). However, in spite of the pivotal role played by information, there are many challenges presently facing the accurate and concise management of information. The accessibility and availability of computing devices has led to an exponential increase in the number of people with the capability to alter the structure, storage and accessibility of data (Thomas, 2009). Soares (2015), Dismute (2010) and Kushner and Villar, (2008) assert that the danger of this ease of access is that data may be compromised,

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reduced or expanded to the detriment of the organisation. Furthermore, there has been a tremendous increase in the amount of data being processed within organisations in recent years. The dearth of trustworthy information due to inconsistencies, redundancy, and variances in the process of data collection and processing has added significant risks, impediment of business change processes and poor managerial decisions to organisational business successes (Korhonen, et al, 2013).

The challenge regarding information governance and necessitating data governance includes; the rapid increase in the volume of data organisations have to process, the complexity of the data, multiple data streams on different devices, personal workstations and bring-your- own- device (BYOD) and the regulatory requirements for compliance (; Soares, 2015; Eckerson, 2014). The advent and expansion of the knowledge economy has brought to the fore the awareness of data as an important asset which requires management and governance if organisations are to make sound strategic and fiscal decisions (; Thomas, 2015; Korhonen et al., 2013). According to Soares (2015) most organisations manage other assets (financial, physical and human) but overlook the immense value inherent in their data. The consequences of poor data quality, lack of repeatable processes regarding data input and output, data management and archiving for an organisation may be dire as the decision making ability of management is severely impacted by all of these factors (Dismute, 2010).

Additionally, most managers in organisations have the perception that data related matters are the responsibility of the Information Technology (IT) department (Seiner, 2014). However, the fact is that the core of decision making which makes data a very important strategic asset is carried out by business managers with little input from IT (Eckerson, 2014). Thus, it transpires that business managers leave the vital tool for their decision making in the hands of IT managers (Seiner, 2014; Eckerson, 2014).

The various regulatory and compliance frameworks which bound organisations to report verifiable information, have auditable and repeatable processes to govern the data which forms the basis of their information are also major challenges organisations have to surmount for them to avoid litigations (Thomas, 2015; Korhonen et al., 2013). Furthermore, the current global atmosphere where stakeholders are more aware; have far- reaching rights and input on how the organisation is governed; and the continual risk of litigation and financial loss due to data theft or mishandling has compelled a scientific handling of “data as an asset” (Kushner and Villar, 2008). Internationally, the Sarbanes-Oxley Act of 2002(USA) commonly referred to as SOX, focuses on internal control, requiring companies to follow a set of rigorous and legally binding processes when storing or processing sensitive financial and related data (Sarbanes-Oxley, 2016). The Act requires the board of directors to ensure compliance with laid down rules and regulations; and they are held accountable for the consequences of non-compliance.

The domain of IT governance encompasses the use of technology for driving compliance processes in the organisation. Within this domain is the field of data governance and its attendant processes which should ensure that an organisation report verifiable and auditable information (Sarsfield, 2009). Soares (2015) and Seiner (2014) both allude to this by stating that data governance is the enabler of the arm of corporate governance which mitigates the risk an organisation would incur in case of unstructured data. There are now more reasons for companies to consider a single entry point for data assets, with a common representative language and a system of continuously monitoring data assets from entry point to storage and disposal in order to ensure compliance and maintain data integrity (Salido, 2010).

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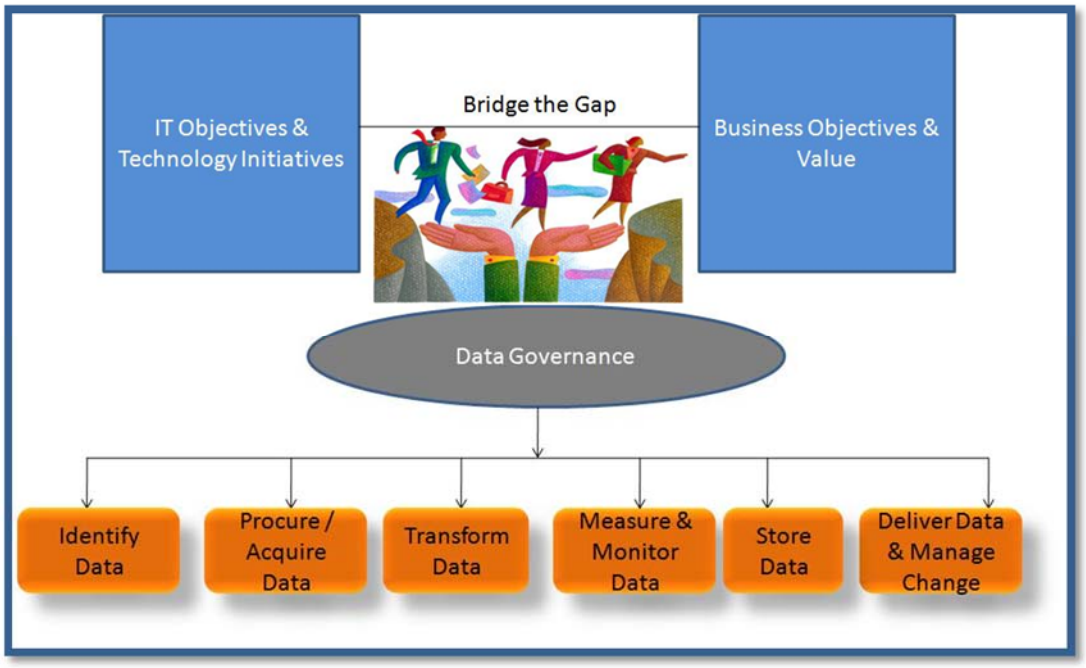
Data at the root of Information Governance

Data governance is defined as *"a system of decision rights and accountabilities for information- related processes, executed according to agreed-upon models which describe who can take what action with what information, and when, under what circumstances, using what methods"* (Thomas, 2015, p. 1) In light of this definition, and the current business climate which outlines and imposes stringent regulatory and compliance reportorial laws on corporations, it has become essential for business managers to ensure that data is scientifically managed to protect the organisation (Soares, 2015; Lipunstov, 2014). The renewed argument for the criticality of data to be treated as an asset relates to the traditional attitude of business managers in treating data governance and management as the problem of the IT department rather than a business asset with tremendous value (Thomas, 2015). One of the strong tools for this is the management and governance of data assets through technologically enabled processes and practices (Alles and Piechocki, 2012). Figure 3 below illustrates this in more detail.

FIGURE 3
DATA GOVERNANCE AS A SUBSET OF IT GOVERNANCE



Source: Infosys, 2015

The diagram illustrates the particular areas covered by data governance. The over-arching control for all the identified processes in the diagram are guided by IT, which is geared towards achieving the goals of the business. The ISO/IEC 38500 framework recommends three main tasks for directors in the guiding of corporate IT governance; evaluation, directing and monitoring (ISO/IEC, 2008). The three techniques recommended for directors to follow by ISO/IEC 38500 for the purpose of governing IT are:

- Evaluate the current and future use of IT
- Direct preparation and implementation of plans and policies to ensure that IT use meets business objectives
- Monitor conformance to policies, and performance against plans.

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The ISO/IEC 38500 framework for the corporate governance of ICT explicitly states that directors have a responsibility to direct plans and policies regarding ICT projects and operations, evaluate all business proposals relating to such and after due processes have been followed in the approval and implementation of such business processes, management has a duty to monitor performance and conformance to agreed processes and principles on the implementation of the operations (ISO/IEC, 2008). According the King III Code of governance (2009), the board has the mandate to provide strategic direction in the way organisations must act.

Due to a barrage of data such as big data; reference data; internet of things; the need for correct reporting of a single version of the truth for both corporate integrity, compliance purposes, risk aversion and accurate fiscal and financial planning became essential data governance drivers (De Haes and Van Grenbergen, 2015; Ammann, Oesch and Markus, 2011; IoDSA, 2009). International standards like ISO/IEC, COBIT and ITIL all refer to the responsibility of ensuring risk is contained and managed by the highest level of authority in the organisation (ISACA, 2013; ITIL, 2011; ISO/IEC, 2008). These drivers make it essential for directors to be effective in IT and related functionalities. The next section of this study takes a critical view of the components of data governance with a view to expounding on its importance as a prerequisite to information governance.

Elements of an effective Data Governance programme

It is considered pertinent to commence the discussion of what constitutes an effective data governance programme with Figure 4 below:

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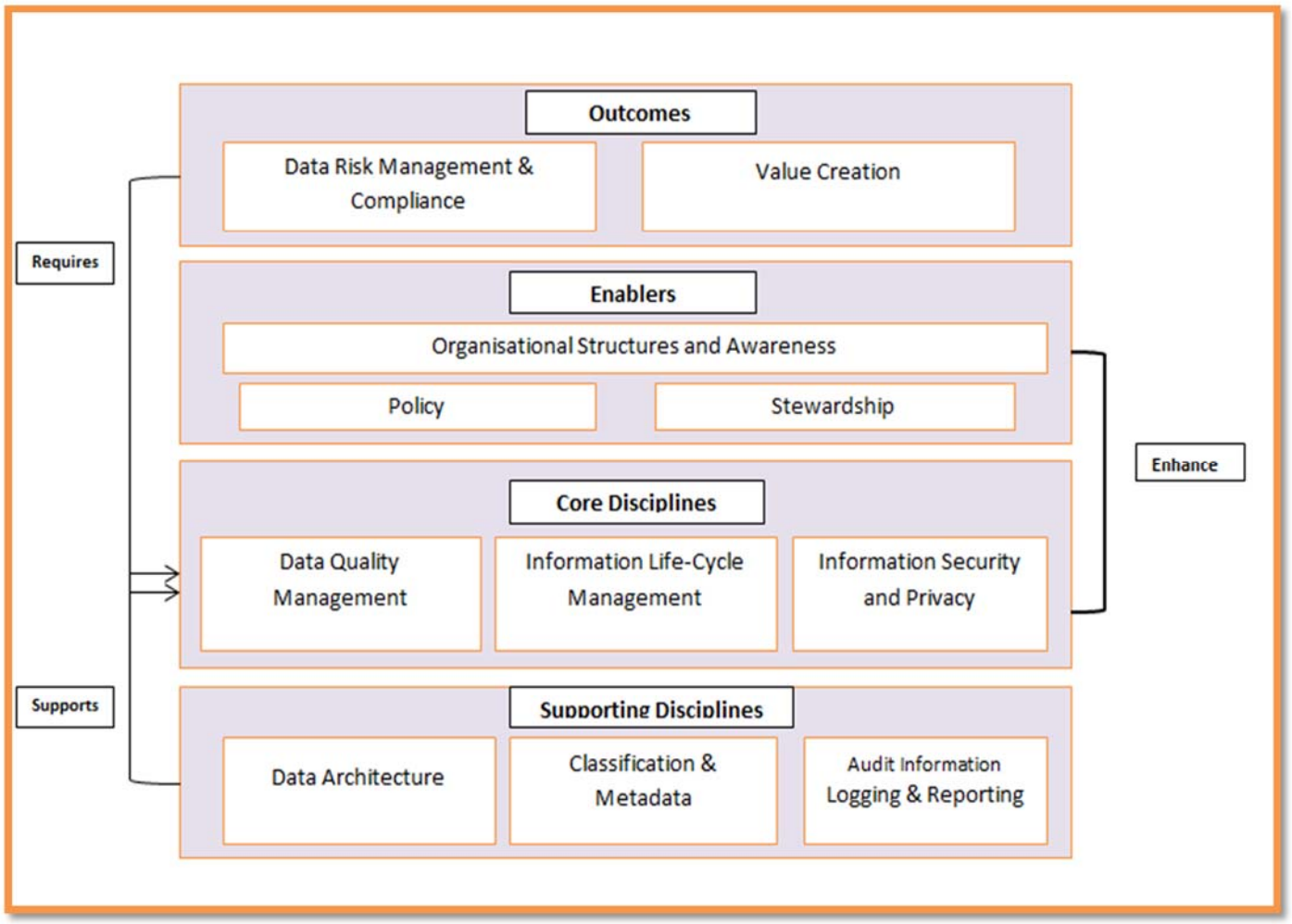
FIGURE 4
ELEMENTS OF EFFECTIVE DATA GOVERNANCE



Source: IBM, 2007

From Figure 4 above, the ground level focuses on the basics of data classification, the development of a classic metadata and the standardisation of information reporting. This ground layer is a subset of the three pronged disciplines of Data Quality Management, Information Life-Cycle Management and Information Security and Privacy. The enablers for the aforementioned components are data policy and stewardships. An effective implementation and management of these two components thereby produce the outcomes of effective risk management, regulatory compliance and ultimately results in maximum creation of value from an organisation's data assets. Based on the foregoing, it is deduced that the IBM data governance domain elements propose the building of the data architecture from the ground up. This structure finds extensive support in widely quoted literature regarding data governance (Fu, Wojak, Neagu, Ridley and Travis, 2011; Khatri and Brown, 2010; Steinhart, 2010).

Discussions: attributes justifying Data Governance as a prerequisite for Information Governance

The attributes below are some of the reasons why this study takes the position that data governance should be a prerequisite of information governance.

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- Ungoverned data leads to information mismanagement; which forms a barrier to accurate and financially sound fiscal planning, thereby putting the organisation at risk of financial, physical and integrity loss.
- Data is at the root of information which translates into the knowledge base used for informed decision making across the entire organisation. For executives to make sound business decisions therefore there must be a repository of trusted, accurate and current data from which to draw information. This can only be achieved when there is an end to end management of the entire process of data capturing to data archiving.
- For information to have the same meaning, connotation and impact amongst all stakeholders, it is important that it has a consistent glossary of definitions. This would eliminate ambiguity and confusion with regards to the intent, meaning and use of words. This feat can only be achieved with entrenched and effective data governance which stipulates a strict glossary of relevant and frequently used data terms across all business units of the organisation.
- Issues of compliance and risk mitigation are a high priority within organisations, mainly due to the access of more people to information and the reality that companies could easily become victims of legal battles if their information is found to be fallacious, unrepresentative of the truth or has been tampered with in any way. The only way to minimise and contain this risk is by ensuring data is governed from the root before it develops into information.
- Organisations are motivated to align their business strategy with their information objectives for maximum impact and competitive advantage. To do this successfully, it is imperative that the data governance function is agile and well positioned to prioritise primary data which would enable the organisation to fully realize its business objectives over administrative data which acts as a support for the business (IoDSA, 2016; OECD, 2015; IoD, 2015; Eckerson, 2014; Korhonen, et al, 2013; Dismute, 2010; McSweeney, 2010; Kushner and Villar, 2008; Hardy, 2006). Based on these attributes, the study now proposes four critical success factors of data governance that should be in place in order to ensure the accuracy, relevance and compliance of information within an organisation.

Critical Success Factors for Data Governance in order to ensure Information Governance is successful within organisations

As opined by Kooper, Maes, and Lindgreen(2010), Information governance enables the optimisation of information interactions and enhances the value of information in a way that makes sense to the actors involved. This assertion is predicated on the argument that the quantifiable value derived from information is the inherent worth of that information to the actor receiving and processing it. In this regard, data plays the role of ensuring that information interactions, be they for compliance, planning or decision making purposes, are of value to the actor accessing and utilising them. This study takes the position that for this to be the case; four critical success factors are needed for data governance to deliver maximum value to information governance in an organisation. These factors have to be in place regardless of the stage of data governance within that organisation. The four critical success factors are discussed below:

- **Business Case**: Due to the challenging economic climate and the lack of interest from executive management regarding the governance of data, most CIOs and data managers are content to have a tacit approval of the board to pursue a data governance programme (Salido, 2010). They do not consider it an important factor to build a business case which directly links data to organisational goals and business strategy (Seiner, 2014). A well-documented business case quantifiably defines value add of data governance in the information governance sphere (Sarsfield, 2009). We opine that a data governance programme must have a business case which is aligned to the information needs of the organisation, meets the test of cost versus value and delivers, in clear terms, the compelling argument for the creation, storage, classification, processing and archiving of data assets.
- **Executive Support**: Executives tend to dismiss data governance as an IT responsibility (Kushner and Villar, 2008). This attitude does not augur well if data governance is to culminate

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in effective information for an organisation. In spite of the level of data governance within the organisation, it is critical for executives to recognise the importance of data assets and to provide quantifiable and visible support for the management of data assets in the organisation. There must be a charter which identifies the vision, mission and establishes clear reportorial lines for decision rights regarding data (Thomas, 2015). Priorities, policies and procedures must be defined. Additionally, a discussion of data stewardships, roles and responsibilities must be ongoing whether or not the governance of data is at an advanced stage within the organisation (Soares, 2015). This support forms an important aspect of ensuring information from currently available data is filtered, accurate and meets standards of both compliance and audit requirements (Lipunstov, 2014).

- **Recognition of Technology Solutions and its limitations in managing data assets**: According to Kooper et al., (2010), and Bearrennchea (2013), the deployment of any technology for the purpose of managing data must be preceded by an understanding of organisational compliance and governance obligations as well as its risk profile. Information governance practitioners must maintain an open communication with data stewards in order to bring about clear data rules for managing data assets (Bearrenechea, 2013). This step presupposes that key members of the executive, IT leaders, business leaders and data stewards should purposefully choose a suitable technology that will help in fulfilling the information needs of the organisation (Chalker, 2014). Technology is used to support effective data governance procedures, it should not be viewed as the only required tool for effective data governance as the dynamics of people, communications and co-operation from other stakeholders are all equally important factors (Bearrenechea, 2013).
- **Defined Communication and Change Management training**: Communication is key to ensuring the success of a data governance programme. Open, continual and honest communication about the centrality of data governance to information governance, as well as the expectations or requirements from employees should form part of the communication plan (Smallwood, 2014). Furthermore, all stakeholders, staff, vendors and risk managers should be made aware of the importance of data governance and related policies within the organisation. The motivation for such policies should be a continuous conversation around the value of data governance towards the end goal of achieving the financial and strategic plans of the organisation (Lucassen and Schraagen, 2011). The depth and breadth of information communicated will depend on the actors involved but an essential ingredient is to make sure all the stakeholders understand the key indicators regarding data governance and its role in successful information dissemination and compliance matters (Bearrenechea, 2013).

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SUMMARY

The objective of this study was to present a case for data governance as a prerequisite for information governance. A plethora of literature, in information governance, data governance and within the ambit of compliance and statutory regulations regarding information management in organisations were examined. Some of these are the King code of South Africa, the ISO/IEC framework and the Sarbanes-Oxley Act of the USA. These were discussed in line with the crucial role played by data in ensuring information accuracy within the organisation. The emphasis placed on the criticality of information as an organisational asset by the draft of King IV code of 2016 was also discussed. The study thereafter outlined what constituted an effective data governance programme and how this impacts on information governance within the organisation. In conclusion, the study outlined a set of attributes which makes it imperative that data governance be considered and treated as a prerequisite to information governance. These attributes were drawn from the extant literature chosen through a careful selection of contents on data governance and information governance. The study thereafter presented four critical success factors for data governance in order to ensure information governance is successful within an organisation.

CONCLUSION

As articulated in section 1, the objective of this study is to argue for a process based approach to data governance as a prerequisite for a successful information governance programme within organisations. A plethora of extant literature was examined to justify this argument, and support for the position that data governance must be perceived, treated and conceived by organisations as an important component and asset if data is to meet the statutory and fiduciary requirements of information governance was found in the literature.

Based on the literature, four critical success factors which would ensure that data delivers maximum value for an information governance programme in an organisation were proposed. These are: The building of a business case for data governance which is aligned to the information needs of the organisation, meets the test of cost versus value and delivers, in clear terms, the compelling argument for the creation, storage, classification, processing and archiving of data assets; Executive support which provides quantifiable and visible backing for the management of data assets in the organisation; Recognition of technology solutions and its limitations in managing data assets. We argue that a comprehensive understanding of important factors such as cooperation of employees and other stakeholders in institutionalising data processes is essential for any chosen data governance technology solution to be successful; Defined communication and change management training which engages in open, continual and honest communication about the centrality of data governance to information governance, as well as the expectations or requirements from employees should form part of the communication plan. The study concludes by expounding that the implementation of these four critical success factors will enhance the ability of data governance to produce data of such veracity that will assure the correctness, validity and relevance of information for strategic planning, risk management and compliance purposes in an organisation.

LIMITATIONS

This study was limited to a review of existing, though current literature in the data and information governance domain. The recommendations were therefore based on the inferences drawn from the literature. The lack of empirical data collection to further prove the conclusions of the study is considered a limitation, and this factor is currently being addressed in on-going research by the authors

RECOMMENDATIONS FOR FUTURE RESEARCH

This study examined extant literature to justify data governance as a prerequisite for information governance in organisations, thereafter proposing four critical success factors to ensure that data delivers maximum value for an information governance programme. Future research which gathers

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empirical data to support or refute this position is recommended. An investigation of the positioning of data governance in ensuring regulatory compliance is also an area for future research.

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