NAVIGATING GOVERNANCE DYNAMICS: THE INTERPLAY BETWEEN DATA GOVERNANCE, CORPORATE GOVERNANCE, AND ORGANIZATIONAL PERFORMANCE

by

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Dedication

I dedicate this work to my family, friends and colleagues without whose support would not have this journey possible. To my mentors, thank your continuous guidance and share of thoughts and direction.

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I express my sincere gratitude to my mentor for guiding and directing me through the period of the research with constructive feedback. Special thanks to my colleagues, mentors, and peers who provided insights, encouragement, and support during challenging moments. I am especially grateful to my family and friends for their patience, thoughtfulness, and firm belief in me. This work would not have been possible without the contributions and support of everyone who stood by me during this endeavour, including the DAMA India community.

ABSTRACT

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2025

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Co-Chair: <If applicable. Co-Chair's Name>

Using a wide range of literature and data sources, this study explores the relationship between data governance, organizational performance, and corporate governance in different organizations. It explores the extent to which the maturity of data governance policies and procedures impacts effectiveness (Sargiotis, 2024). Through bibliometric analysis, the study defined clear boundaries for data governance and also examined previous and ongoing research trends while identifying fifteen factors that contribute to the data governance domain. It also examines if factors of corporate governance moderate the relationship between processes of data governance and organizational outcomes, and then, the extent to which the convergence of corporate and data governance goals contributes to improved performance.

To validate these relationships empirically, the study formulates and tests three hypotheses using quantitative research methodologies, focusing on direct influences, moderating effects, and strategic alignment between governance domains. Management and staff from various businesses worldwide having front office or back-office operations

in India, were asked to provide responses to questionnaires. To validate conceptual model, statistical methods such as reliability, regression, and correlation analysis were employed. The research highlights whether data governance improves efficiency in operations and which factors like accuracy of data, thereby insights, security, and compliance contribute the most. At the same time, the research indicates how facets of corporate governance including leadership structures, regulatory adherence, risk management and accountability influence the performance of organizations through apt governance of data.

One of the findings is higher the maturity in data governance the better is the performance of organization. This can be enabled by improving customer satisfaction, efficiency of daily operations, engagement of employees, time to market as factors enhancing brand value and reputation. Furthermore, the second hypothesis proves that corporate governance acts as a moderating factor in organizations governing data to improve on their efficiency. Specifically, organizations with strong corporate governance frameworks experience benefits from data governance initiatives through improved accountability structures, risk management, and stronger compliance. Adding to the research, the third hypothesis finding reveals that the alignment of objectives among corporate governance and data governance is positively associated with higher performance. The research findings offer important know-how to industry leaders along with policymakers and research experts who should study governance mechanisms. Future research should investigate additional factors such as technological innovations and influences to enhance governance frameworks further.

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LIST OF ABBREVIATIONS

Abbreviations	Full Form
AGM	Agile Governance Model
AI	Artificial Intelligence
AMI	Anti Money Laundering
BI	Business Intelligence
BT	British Telecom
CARE	Control, Responsibility, And Ethics
CCO	Customer-Centric Orientation
CCPA	California Consumer Privacy Act
CG	Corporate Governance
CIO	Chief Information Officer
COBIT	Control Objectives for Information and Related Technology
CRM	Customer Relationship Management
DCI	Data Compliance Innovation
DG	Data Governance
DGI	Data Governance Institute
DGAG	Data Governance Advisory Group
EDM	Enterprise Data Management
ERP	Enterprise Resource Planning
ESG	Environmental, Social, And Governance
FAIR	Findable, Accessible, Interoperable, Reusable
GCPR	General Data Protection Regulation
GRC	Governance Risk Compliance

GTL	Governance Team Leadership
IT	Information Technology
IFRS	
ML	Machine Learning
NBFC	Non−Bank Financial Companies
OP	Operational Performance
OSI	Open Social Innovation
PDPS	Personal Data Protection Systems
SPSS	Statistical Package for The Social Sciences
SOX	Sarbanes Oxley Act
TDQM	Total Data Quality Management
TQDM	Total Quality Data Management

CHAPTER I:

INTRODUCTION

1.1 Introduction

Data governance, along with corporate governance, remains a vital organizational function that determines overall effectiveness in business structures (Abueed and Aga, 2019). Effective data governance is grounded in foundational principles such as data availability, quality, compliance with regulatory requirements, and robust privacy checks (Sargiotis, 2024). In contrast, the main resolve of corporate governance is to maintain accountability, transparency, and safeguarding of stakeholders' interests through the policy, procedures, and mechanisms that govern business operations (Aragão, 2023; Rezaee, 2023). As the digital transformation and regulatory challenges evolve in the ecosystem, it's more important that these two frameworks are aligned.

When organizations integrate data governance into their corporate governance frameworks, they experience an increased level of enhanced decision-making, streamlined operations, and compliance with regulations. As data in organization expands, data governance is required for managing actively both customer and accounting data (Pierce, 2008; Alhassan, Sammon, and Daly, 2016). Consequently, aligning back-office processes to data management processes through data governance leads to operational efficiency and outstanding customer service. Data governance policies must support and fulfill organizational goals under strong corporate governance oversight. Good corporate governance practices foster work environments that promote ethical accountability among employees. Maintaining strong accountability preserves trust with customers, regulators, and investors. Organizations must make data governance principles strong enough for innovation and long-term growth through their corporate frameworks as they adopt modern digital systems. Organizations performing optimally in

all aspects of risk management, innovation, and market response implement these governance frameworks with success. These factors are aligned to create a platform for an organization’s long-term success via improved operational efficiency, improved financial performance, and improved consumer trust.

Data Governance

The fact that an organization can produce a masterpiece out of data processing in the business areas is determined by data governance (Abueed and Aga, 2019). Efficient governance of data ensures the reliability, accuracy, and consistency of the data. Making well-informed decisions requires having trustworthy information, which helps businesses make strategic decisions. Improved data quality increases the reliability of business processes, reduces errors and hazards in day-to-day operations, and ultimately boosts organizational performance (Scheepers and Deschamps, 2018; Yin and Li, 2022). The current regulatory environment is putting more and more pressure on organizations to follow data privacy legislation and industry standards. A company's data governance department creates policies and guidelines to guarantee adherence to pertinent regulations, including the Sarbanes Oxley Act (SOX), the General Data Protection Regulation (GDPR), and the Health Insurance Portability and Accountability Act (HIPAA) (Arkenea, 2023). By handling data securely and morally, organizations may safeguard their performance and lower their risk of legal issues, fines for noncompliance, and reputational damage (Handoyo, 2023; Maestre-Góngora and Aponte, 2023).

Good data governance practices make data management processes repeatable for consistent results and lessen operational inefficiencies caused by challenges in quality. By defining roles and accountabilities, standardizing formats, automating routine data quality as well as integration procedures, organizations can reduce overhead costs associated with data handling and increase operational efficiency. Resource savings from

increased productivity allow organizations to invest in projects that improve performance and make better use of their resources (Scheepers and Deschamps, 2018; Yin and Li, 2022).

Data governance also supports personalized services through product data analysis. By centralizing consumer data, analyzing purchasing trends, and customizing marketing campaigns, businesses may enhance customer satisfaction and retention. Client satisfaction increases a company's chances of retaining customers, referring business to others, and increasing sales, all of which enhance organizational effectiveness. Data governance increases data accessibility and encourages experimentation, which promotes an innovative culture (Gao, Pan, and Ye, 2023; Pedersen, 2023; Tello, Barbazza, and Waddell, 2020)). Agile companies are better equipped to seize new opportunities, outperform competitors, and encourage ongoing development when they use data effectively, thus enhancing performance (Sheikh, Foth, and Mitchell, 2023). Improving an organization's performance requires effectively governing data quality, minimizes risks, synchronizes procedures with regulatory requirements. Furthermore, it improves customer happiness, cultivates innovation, boosts operational efficiency, and raises the organization's adaptability (Koilakonda, 2024). Establishing strong data governance procedures allows businesses to make money off of their data assets and promote long-term success (Liu *et al.*, 2023; Liu, Li, and Jomaas, 2022).

Data Governance in Relation to Organizational Performance

In enterprises where data is essential to operational success, data governance is especially important for improving organizational performance. Data governance improves decision-making, operational efficiency, and regulatory compliance when executed correctly because it guarantees that data is accurate, accessible, and intact (Sargiotis, 2024). Delivering exceptional customer experiences and staying ahead of the

competition in the fiercely competitive financial business requires dependable, high-quality data (Khatri and Brown, 2010). Moreover, privacy breaches and cyberattacks are on the rise, making it more important than ever to safeguard information. Strict data protection and access control measures enforced by effective data governance principles lessen the likelihood of security breaches (Khatri and Brown, 2010). Customers' and stakeholders' sensitive financial and personal information is safeguarded, and trust is also fostered. Consequently, data-related risks cause fewer disruptions and lower costs for institutions with strong data governance systems.

Better decision-making is another direct result of data governance. Better strategic planning, risk assessment, and forecasting are all made possible with high-quality data that is well-governed (Loshin, 2011). An organization’s success is improved by its capability to adapt quickly to market dynamics (Vasilieva et al., 2024). Demonstrated in the work of research by Ravichandran and Lertwongsatien (2005) Businesses get a competitive edge and improve operational efficiency by using data analytics (Sycheva, Klimenko and Kruglova, 2024). This is especially true for enterprises that have robust data governance frameworks. Improved financial performance can be achieved by organizations through optimization of operations, streamlining of processes, and reduction of redundancies made possible by consistent and trustworthy data.

Another area where data governance strongly influences corporate performance is regulatory compliance. If the rules from regulators like General Data Protection Regulation (GDPR) are broken, there could be serious repercussions and reputational harm. By being transparent, monitoring data consumption, and managing and storing data securely, organizations can meet regulatory obligations through effective data governance (Alhassan, Sammon and Daly, 2016).

Necessity for Corporate Governance

The need for corporate governance has always been there, even before formal organizations with shareholding came into being. Firth, Fung, and Rui (2007) state that Adam Smith was the first to bring attention to the necessity of good corporate governance. Large organizations with distributed ownership sometimes face governance challenges due to the separation of control from ownership. Making sure management is making good use of investor money to create value is a challenge for those who put their money into public corporations. This split between ownership and management has led to new forms of corporate governance that aim to address issues with oversight in publicly traded corporations.

A wide range of academic fields contributes to the enormous breadth and depth of corporate governance. Scholars and researchers define corporate governance differently based on their perspective on the issue, which is a result of the plurality of the subject. The Cadbury Committee provided one of the first definitions of governing Organizations (Okeahalam, 2004). The directors on the board are primarily in charge of monitoring the company's governance (Rezaee, 2023). A shareholder's function, on the other hand, is restricted to appointing the board of directors and auditors and making sure the business has an appropriate governance structure (Mulili and Wong, 2011).

Corporate Governance and Its Influence on Organizational Success

The term Corporate Governance describes the systems, practices, and relationships that allow for the direction as well as control of organizations. Corporate governance is a significant component in organizations' ability to achieve organizational performance and to stay in compliance with applicable laws. To promote organizational

performance and sustainability, it offers a framework that businesses may use to make sure their connections with stakeholders are fair, transparent, and accountable.

By establishing mechanisms that connect management's goals with shareholders' interests, good corporate governance greatly improves financial performance. Governance controls like performance-based incentives and board oversight provide alignment of managerial actions to shareholders' interests thus reducing agency dilemmas (Jensen and Meckling, 1976). This congruence is critical for organizations because it guarantees that management will make decisions that benefit the company, which in turn boosts profitability, value for shareholders, and the quality of financial decisions made.

An important domain where corporate governance affects the financial sector is risk management. Proper risk identification, assessment, and mitigation are hallmarks of good governance frameworks. Companies with solid leadership are better equipped to handle financial risks and weather storms. This is of utmost importance in the organizations, due to the ever-present dangers of market volatility, liquidity, and credit. To effectively handle crises and keep operations stable, governance structures should require strong risk management procedures, such as independent audit committees and unambiguous risk oversight from boards.

In addition, the strategic alignment and flexibility of firms are positively impacted by good corporate governance. Companies can better manage their long-term strategy and short-term finances when they have solid governance structures in place. Companies with strong governance systems have a better chance of succeeding in the long run (Gompers, Ishii and Metrick, 2003). The importance of this cannot be overstated in organizations, as their strategy decisions are constantly being influenced by market trends, consumer demands, and technological advancements. To succeed in the long run,

especially when faced with competition, good governance is essential in keeping boards and management focused on sustainable growth (Atuahene and Xusheng, 2024).

Another area where corporate governance greatly influences company performance is stakeholder trust. Accountability to all stakeholders, openness to feedback, and ethical leadership all contribute to a trustworthy environment. Donaldson and Preston (1995) argue that shareholder interests aren't the only ones that matter in a governance system; stakeholders' interests, including those of employees, consumers, and the community at large, must also be taken into account. To keep customers loyal, attract investors, and guard their brand, organizations must keep stakeholder trust at high levels. Finally, organizational innovation is supported by governance frameworks, which hold leadership accountable for creating a creative and progressive workplace. A good governance process adds to an organization’s capacity to expand and survive in time.

The Interaction between Data Governance, Corporate Governance, and Organizational Performance

Data governance and corporate governance, when implemented in a way that enhances their complementary capabilities, will be great enablers for improved performance of organizations, especially those in areas such as banking (Matos and Rosa, 2022). Governance of data focusses on enabling its active management while the resolve from corporate governance is to address accountability, transparency, and decision-making within an organization. There are two important forms of governance: to be competitive, manage the risk actively, and comply with complex regulations.

Governance of data and corporate governance are converging across organizations in the sector of financial services sector, as they evolve along with increasing regulatory scrutiny and data privacy compliances (Sari, 2023). The integrating data governance into corporate governance will produce unified policies that help

organizations align management of data to the overall business objectives (Weber, Otto, and Österle, 2009). In this context, having alignment of data-associated decisions means confirming how data-related decisions are suggested about corporate policies to achieve transparency, accountability, and responsible treatment of sensitive financial or customer data.

In addition, corporate governance will ensure that leadership support and resources for data governance are available. Despite data governance efforts not requiring board-level oversight, their influence on an organization's strategic goals can still be limited to IT departments alone. Tallon, Ramirez, and Short (2013) point out that when corporate governance frameworks explicitly include data governance as a part of their core, they are more able to use data for competitive advantage.

A synergy of data governance with corporate governance becomes most important in the risk management. Data governance is strong only if data is accurate and secure and corporate governance is strong in the organization's systems to protect the organization, covering both the operational and the reputational risks (Peterson, 2004; Lestari, 2020). Dutta and Bose (2015) also point to the process of integrating these governance frameworks, to help organizations meet the highest regulatory standards: such as GDPR or the Basel III framework. Not only does this protect the institution legally and financially, but it also puts out there a commitment to protect sensitive information, something customers assume they can trust their bank or any institution for.

Furthermore, organizational agility is enhanced through the integration of data governance with corporate governance. The market environment today is constantly changing, and organizations have to react quickly to new regulations, technology changes, and preferences of the customers (Allioui and Mourdi, 2023). Researchers including Khatri and Brown (2010) explains that those harmonizing corporate and data

governance domains are prepared to react to these changes by utilizing dependable real-time data to make agile decisions. This can be achieved by letting the synergy safeguard the data-driven decisions that are strategically aligned and compliant with regulatory requirements. Thereby, the operational efficiency improves while being able to manage risks effectively and maintain customers' trust.

1.2 Problem Statement

To satisfy the objectives of managing data as an asset, majority of firms are formalizing their data governance functions. Issues including inadequate data quality, information silos, lack of understanding among stakeholders, and compliance risks are some of the challenges in data management. Addressing this issue is critical for these organizations to make good use of their data in support of strategic decision-making and operational efficiency (Gathogo, Karume and Karani, 2025). As such, nowadays, for organizations to fully utilize their data assets and ensure sustainable results, they must be aware of and resolve such difficulties (Gathogo, Karume and Karani, 2025). Getting past these difficulties will have the advantages, including long-term sustainable effects, economic sustainability, social and environmental effects, organizational resilience, stakeholder satisfaction, flexibility and innovation, and strategic decision-making.

Refining organizational data governance mechanisms by organizational strategic goals can be very complex for some organizations. Data management challenges include variable data quality, fragmented data stewards, a lack of knowledge of the dangers associated with poor data stewardship, and the possibility of noncompliance. The accuracy and dependability of the data used in operational and regulatory reporting make data governance strong (Khang, 2025). Given the issue of IT-related difficulties, such as the uncertainty in relationships between IT infrastructure components and data quality concerns that are required to make accurate strategic decisions, this is extremely

important. Because it guarantees that all data-related activities are operating by regulatory requirements. Organizations must tackle these issues as it is indispensable for them to capitalize on their data to make accurate decisions and boost operational efficiency (Sooch, 2023). The implementation of these hurdles has led to the modern world where data is a considered an asset, and therefore organizations will have to understand these hurdles and break through them to maximize the utilization of their data assets and ensure long-term prosperity.

1.3 Purpose of Research

The main purpose of this study is as follows -

a) To produce a thorough conceptual framework for data governance that addresses the interaction between corporate governance principles and data governance practices within firms in a way that impacts organizational performance

b) To validate empirically the impact that governing data has on the organizational performance and further, identify if corporate governance influences this relationship

c) To provide regulatory compliance, risk mitigation, and reputation management search-backed recommendations for CXOs, data leaders, and governance professionals and align them with strategic objectives

1.4 Implications of the Study

Organizations' performance is driven by the data operations, and often optimization and evolution of data governance processes are required. A conceptual framework that combines corporate governance and data governance is provided, which is workable to create practices that can sustain active management of data. The model's empirical validation fills an important gap in knowledge about how organizational data

governance impacts organizational outcomes. In the end, the study furnishes the stakeholders with useful knowledge to propel organizational performance in the modern data-driven environment.

1.5 Research Purpose and Questions

In modern digital and data-centric financial landscapes, as organizations evolve into data-centric settings, the necessity for robust governance frameworks becomes essential to guarantee responsible data management and strategic utilization. This study underscores that effective governance is not just a regulatory or tactical need but a planned imperative that can stimulate innovation, cultivate consumer trust, and improve competitive advantage in the increasingly intricate financial landscape. More specifically, the research questions are -

- Which factors in data governance drive performance improvements in organizations, and how can executives and data leaders effectively embed these practices into the organization?
- Does corporate governance moderate the relationship between data governance practices and organizational performance, and which governance mechanisms are most influential?
- How does the alignment of corporate and data governance goals contribute to organizational performance?

CHAPTER II:

LITERATURE REVIEW

2.1 Introduction

Governance as a term has been used for several years and comes from an ancient Greek verb referring to ‘to steer’ (Kumar and Roberts, 2020). Experts have discussed various strategies and concepts that organizations can adopt to safeguard shareholder value in circumstances where the goals of the organization's managers may not align with those of its shareholders. Mcmanus and White (2008) state that governance is the combination of procedures and structures used to direct and manage data operations, emphasizing accountability and stakeholder management. Several governance disciplines are embraced in organizations, including Information Technology (IT) governance, corporate governance, data governance, environmental governance, and global governance (Masilela, 2019). For the literature review, we will use the terms data governance and corporate governance (Masilela, 2019). Data governance has seen light by using cascading principles from domains including corporate governance and information governance. A further specialized domain called corporate data governance has evolved from data governance which balances risk and value to organizations from data.

Definition of Governance Domains

- **Corporate Governance (CG)**

The term CG pertains to a blend of transparent policies, practices, laws, regulations, procedures, and voluntary initiatives that organizations take to enhance the long-term value of their shareholders and remain accountable to diverse stakeholders (Tonk and Arora, 2011). Corporate governance involves managing a company and its stakeholder relationships, including the board of directors and senior management (Kim,

2012; Rowling, 2016). Data Governance shares principles like accountability, transparency, and risk management with Corporate Governance (Lestari, 2020a; Traulsen and Tröbs, 2011). However, Corporate Governance focuses on broader organizational oversight and leadership, while data governance specifically deals with data management.

- **Information Technology (IT) Governance:**

IT governance refers to the ability and function of an organization, including its board, executive management, and IT management, to efficiently oversee the development and execution of the IT strategy (Grembergen et al., 2021).

- **Data Governance (DG)**

Data governance (DG) provides an organized framework for managing data assets. By implementing clear processes for collecting, evaluating, and disseminating data, organizations can improve their capacity to make well-informed decisions and create effective strategic plans.

- **Information Governance:**

Information governance is an essential science for organizational management, including leadership structures, relational mechanisms, and processes to ensure the proper use of information assets (Khatri, 2010). Data Governance acts as a sub-discipline of Information Governance, focusing specifically on strategies and policies for data management (Traulsen and Tröbs, 2011). Information Governance encompasses a broader scope, managing all information assets, including data, documents, and records.

- **Corporate Data Governance**

Corporate data governance is a derived science from governance of data as well as risk governance and is leveraged to maximize value and minimize risk (Tallon, 2013). The term corporate data governance is different in principle from the previously referred to common term data governance. It is derived from principles of governance of data as

well as corporate governance (Dahlberg and Nokkala, 2015). By corporate governance objectives, corporate data governance frameworks should support market integrity and economic performance. Organizations need a framework that can assist them in assessing and monitoring their advancement toward their objectives while making certain that the concerns of all stakeholders are considered. Corporate data governance may have a different scope and goals compared to a standard data governance framework.

Data Management and Governance in Modern Organizations

Organizations must ensure a sound corporate governance framework to safeguard data deemed valuable (Tang, 2018). We have known since the 1970s that purchasing information and data at a cost can led to optimal economies of scale (Wilson, 1975). Data is considered an asset that organizations must use to manage and oversee through a good corporate governance framework (Tang, 2018). The data thus curated by organizations can be directly or indirectly monetized to provide value. Approximately 75% of organizations worldwide are projected to establish a centralized analytics and data center of excellence by 2024. These centers will help them support federated analytics and data initiatives and prevent failures in their enterprise (Duncan, 2021). To assess, monitor, and thereby direct protect the organizations' data and infrastructure, they must implement procedures and practices that can embed them into continuous routines. Regulations that govern organizations, such as those in European countries, have become increasingly authoritative since the General Data Protection Legislation (EU Parliament, 2016) was passed (Marelli, Lievevrouw, and Van Hoyweghen, 2020).

Tang (2018) highlighted the requirement for data governance frameworks in organizations with an emphasis on actively managing data. In sequence, Marelli, Lievevrouw, and Van Hoyweghen (2020) and Amoo et al. (2024) discussed the effect of the European Union's General Data Protection Regulation (GDPR) on data governance,

aligning with the discussion on regulations influencing organizations. It is necessity to formalize data operations and processes of data governance in enforcing policy and ownership of data (Khatri and Brown 2010). The insights presented by Tallon (2013) show how corporate governance dynamics intertwine with performance of organizations, indirectly establishing considerations regarding data governance influences. The research highlights the criticality of aspects like stakeholder interests that impact the performance through the right governance mechanisms like data as well as management structures. Such contingent frameworks are not only important for maintaining data integrity covering aspects like quality and accuracy but also for aligning data governance goals within broader corporate governance objectives.

History of Data Governance

Over the years, governing data as a function evolved in organizations, from an IT function to a formal data function with a laser sharp focus on value creation and reduction of risk exposure. Data governance is crucial in platform ecosystems, where data considered as a transformation asset (Une Lee et al., 2017). Therefore, to define data governance, which is often the first step in organizations. involves assigning responsibilities, decision-making authority, and accountability related to management of data to specific individuals or stakeholder groups (Khatri and Brown, 2010). As data governance is established as a program or function, organizations ensure that data management policies defined are thereby enforced, and ownership of data is trickled into the employees. Thus, data governance focuses on formalizing the data-operations through appropriate roles, responsibilities, and accountability.

Data governance enhances the level of management of data to the extent it is required as per maturity, which often without this function, is not observed. Moreover, it is possible to govern data by implementing oversight over the technical and business

change management activities that contribute to the evolution of an organization (Bollweg, 2022). The “Enterprise Data Management Council” (EDM Council) says that data governance is a process of establishing and executing guidelines or policies, regulations, and optimal methods for managing data (EDM Council, 2020; Mertens and Wulf, 2020). Illustrated by the “Data Governance Institute” (DGI), it is a set of rights for decision making along with responsibilities in executing the data processes. These processes are executed basis agreed-upon models that outline which individuals are authorized to take specific actions related to quality, information, modelling, architecture, protection, and security of data. The models also specify when these processes are executed, under what circumstances they can be triggered, and what routines need to be used (Data Governance Institute, 2022; Chandra et al., 2024).

Data Governance Framework

To effectively manage and govern data in organizations, data governance models and frameworks are needed (Bento, Neto, and Corte-Real, 2022). These frameworks are particularly crucial in ensuring data quality, accuracy, lineage, and protection, as required by directives such as Sarbanes-Oxley (Cheong and Chang, 2007). They also have an important role in aligning data management and data operations with business strategy and in fostering collaboration between business and IT (Alhassan, Sammon and Daly, 2016; Cheong and Chang, 2007; Dahlberg and Nokkala, 2015; Khatri and Brown, 2010; Tallon, Ramirez, and Short, 2013; Tallon, 2013). Earlier research performed on analyzing the influence of data governance on organizational performance has yielded mixed results. Both researchers, Neff (2013) and Martijn (2015), examined in the logistics and retail sectors that organization’s performance is related to data governance. Also, Aggarwal (2013) and Bøhren (2004) identified a relationship between organizational performance through corporate governance in a optimistic way. This further emphasizes

the role that ethics, transparency, and credibility play. Fadler (2021) identified three data governance archetypes that can enhance organizational performance, while Putro (2016) highlighted the importance of guidance at the top and culture in data governance specifically for higher education institutions. However, Khatri and Brown (2010) and Olaitan (2017) identified the complexities of data governance, corporate governance and its relationship, emphasizing the need for a clear framework to better understand the influences.

2.2 Bibliometric Study of Data Governance

A key objective is to analyze published literature and professional articles to come up with the boundaries of data governance in organizations, as well as important factors that are the key themes of various literature gaps over time. Furthermore, the study will analyze factors that are important in governing data as well as how corporate governance and organization performance are affected by data governance.

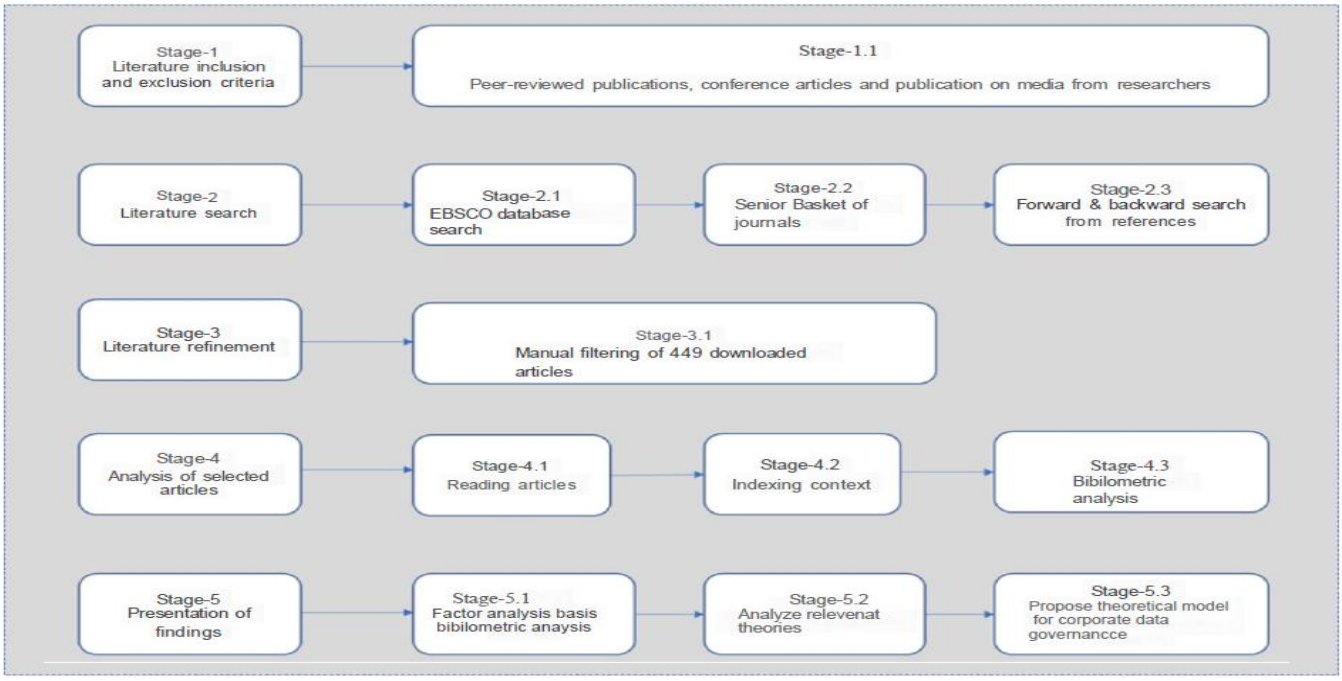


Figure 2.1
Steps followed for Bibliometric analysis

The steps followed to arrive at the factors are:

- Literature selection criteria - The literature comprises peer-reviewed publications from journals, articles, and publications on digital media from researchers.
- Literature search - The EBSCO database has been considered for the search on literature with the keyword “Data Governance”. A senior basket includes eight journals and a forward as well as a backward search has been conducted using the references.
- Literature refinement - From the broad search, based on the abstract, 449 journal articles have been identified for further analysis.
- Analysis of articles - The articles have been analyzed for content, citation, and collaboration patterns. The analysis highlighted trends and patterns in the research. Further, a bibliometric analysis was conducted on these research journals.
- Keywords from the titles and abstracts were mined from research by exporting from EBSCO
- A keyword co-occurrence analysis has been performed using VOS Viewer.
- For keyword analysis, the option of full counting is selected. The relatedness of the items is determined by quantity of documents that have the same keyword occurs
- Out of 747 keywords, basis the frequency of occurrence as well as the fit to variables, a selection of 15 keywords has been made. The selected keywords are then grouped into factors based on their shared characteristics.

- Presentation of findings - Based on the analysis of 15 keywords, a backward analysis of research journals was done to identify the factors. These factors have been reviewed extensively. Two theories (i.e., Contingency theory and Agency theory) have been identified for further application to data governance. Then, a theoretical model has been proposed based on the findings.

Data Governance Frameworks, their Evolution, and Factor Identification

A topic-centric approach to literature reviews, similar to Gong and Janssen (2019) and Senyo (2019), is taken. Relevant information from scientific literature and practitioner publications is summarized. Since the 1990s, firms have been evolving their frameworks that govern data, and since then, there have been even more swift changes happening. The EDM Council's research on data governance from 2023 indicates that organizations have shown healthy growth in the implementation of programs across all industries. Nearly 80% of organizations that participated reporting that their governance programs are in progress or already established. This is a strategic priority for organizations given the increasing responsibility data professionals are facing in ensuring data privacy and ensuring data usage is both ethical and proper (EDM Council, 2023).

As the current literature focuses mostly on academic papers with less coverage on conference proceedings and books, the same were considered as well. Therefore, there is a need for further empirical research to validate theoretical assumptions (Pavone, Ricci, and Calogero, 2023). Both researchers Leão (2022) and Jagals, Karger and Ahlemann (2019) call out that research in data governance is scarce, and they also indicate a shift in focus towards the inter-organizational framework of data governance. For the systematic literature review, other sources such as conference proceedings and books that collect implementable research have been considered.

Over time, research on data governance has also matured in the 2000s, and these considerations have been included. In addition, the technique called keyword co-occurrence analysis was used to provide boundaries to the domain, while also identifying relationships between the factors. These clusters of keywords or topics include terms such as corporate governance, value, strategy, big data, data quality, privacy, data ethics, and data management.

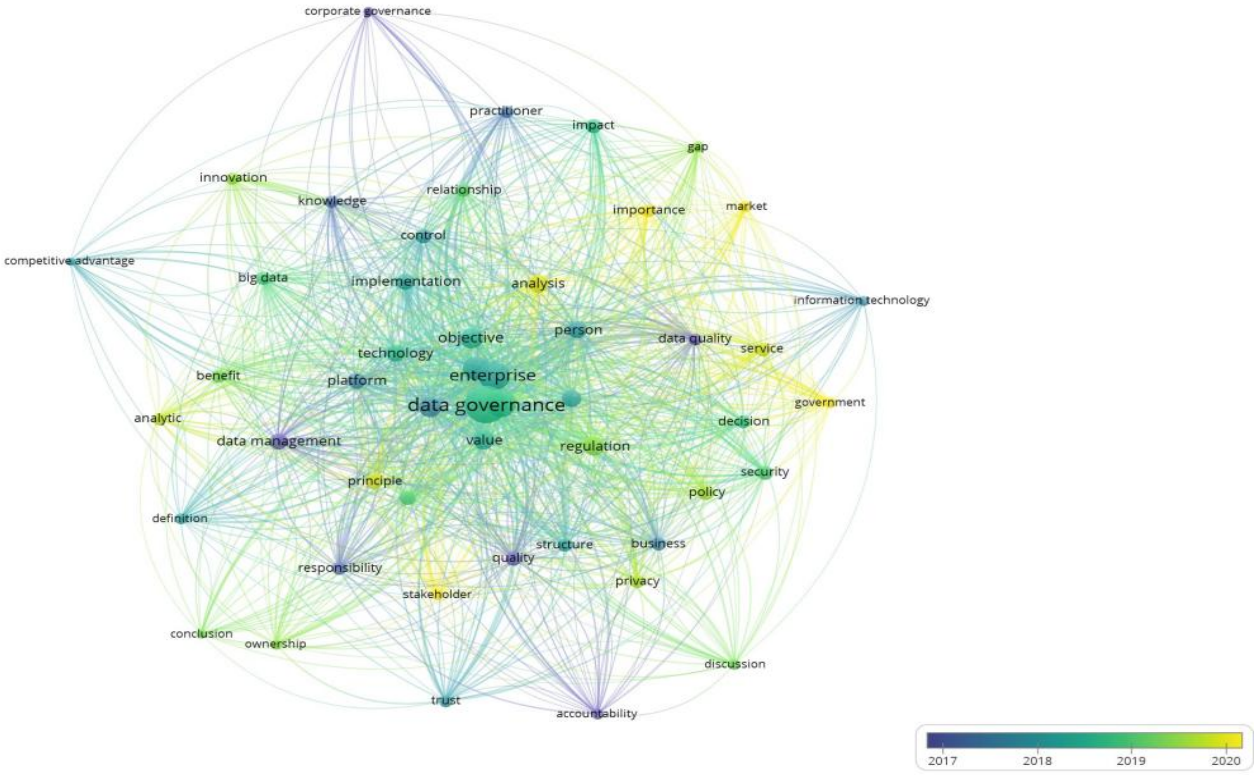


Figure 2.2
Keyword co-occurrence analysis from VOS viewer

VOS viewer has been broadly used for the analysis of keywords. As stated by Jan van Eck and Waltman (2011), the VOS viewer is used to analyze huge amounts of textual data and to imagine bibliometric networks. To compare the research, the EBSCO database is considered a database aggregator that collects multiple journals from several

publishers. In addition, the EBSCO Database provides more economics and business journals than other databases like ProQuest. The research is divided into three time frames: 2011-2017, 2017-2020, and 2021-2023. From the data governance research in select academic journals and publications before 2017, five factors were identified basis the keyword analysis and density analysis, i.e., data quality, accountability, data management, corporate governance, and knowledge. Most research was directed towards the maturation of these factors during 2010-2017. The keywords from the keyword co-occurrence analysis are available in Figure 2.3.

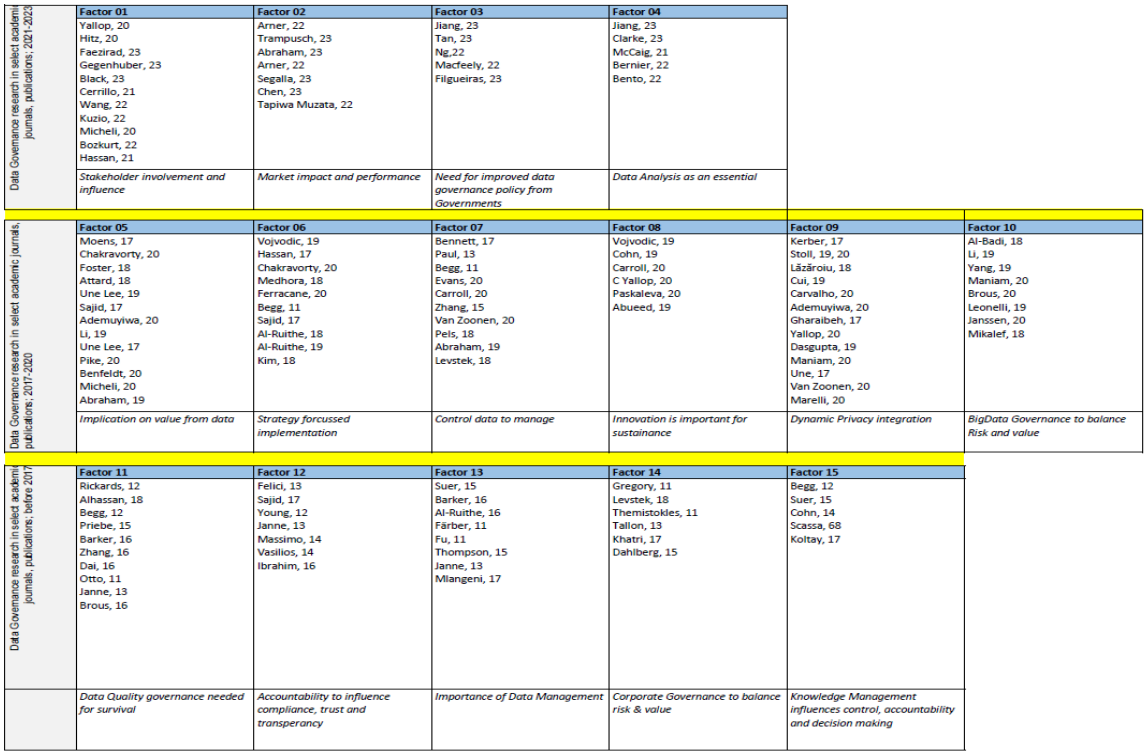


Figure 2.3
Keyword analysis and Factors derived using Bibliometric analysis

Data Quality Governance in Organizations

Many research studies state that for an organization to sustain, there has to be continuous governance of the quality of data. Overly bureaucratic organizations often

have a challenge in governing data, as it impedes decision-making structures. For example, too much focus on data quality can hinder innovation and creativity (Shankaranarayanan and Cai, 2006). Quality need not be a specific set of activities performed only by the data quality team; the required services, processes, and tools can be integrated into functions like risk, finance, and audit as well.

This is due to the relationship between IT tools, their ownership, the quality of data, and their impact on reporting. There is less empirical work that has explored how organizations support such initiatives through the right budgetary decisions or evaluate their return on investment (Rickards and Rolf, 2012).

Researchers Alhassan, Sammon, and Daly (2018) point to one hundred and twenty activities in data governance. Along with their analysis, a model is presented that differentiates activities between scientific and practice-related journals. This helped the researchers in identifying gaps between sub-domains of defining and implementing data quality. It's acknowledged across research that data governance adds value to the organization however, it has not been validated empirically through research. While most research is on organizations of scale, some researchers like Begg and Caira (2012) and Tiilikainen (2023) explore how small to medium-sized enterprises (SMEs) view governance from the perspective of maintaining the quality of data. In addition, they explored if the existing frameworks can be force-fit to SMEs. This analysis uncovered that data governance domain is yet to evolve to meet the needs of such an industry, which warrants additional research.

As researchers explore large data projects and the impact of governing the quality of data in organizations and SMEs, Priebe (2015) explores a methodology that should be adopted in a data-heavy projects to elicit requirements. Use of business and logical model is to be reinforced in data warehousing as well as in quality assurance activities, where

stewards are required to play an active role. Barker (2016) conducted a distinctive study involving 100 professionals across 41 organizations that offer insights into how data governance programs are implemented in reality in organizations (Sargiotis, 2024). The study identifies six areas, including the implementation of data quality linked to value creation in organizations. While with earlier research, frameworks were explored, Zhang (2016) critically examined the key challenges in data governance, including concerns on generalization, quality indicators, along areas of practical implications.

Technology like profiling of data for deriving initial quality characteristics and issues can be leveraged for data governance and quality control efforts in organizations. Several profiling techniques like structural metadata, format of data, also called data types, content profiling, distribution of values, and logical rule profiling can be used for initial data quality analysis (Otto, 2011; Dai et al., 2016). Advancing this discussion, Otto (2011) highlights case studies from British Telecom (BT) and Deutsche Telekom on how they approach data governance through distinct designs of organizational structure and recommend further research into effective data quality and governance implementation. The study examines how styles of orchestration vary between grassroots-driven and leadership-led models.

As per Korhonen et al. (2013), if organizations are serious about resolving the issues in the quality of data that is impacting the value, accountability aspects of people will have to be stressed on. In an organization that wants to formality, there must be a basis for designing a governance structure for assigning decision rights and responsibilities. Hence, organizations can adopt the Agile Governance Model (AGM) that provides the required basis while following the principles of a circle organization called sociocracy (Korhonen et al., 2013). In this approach, circles meet regularly and make decisions based on data from both their circle as well as neighboring circles, where a

circle can be identical to a division. The decision-making process is effective when at least two people who belong to both circles are double-linked to each other (Korhonen et al., 2013). Moreover, Brous and Jannsen (2020) conducted an analysis based on case studies in transportation and asset management domains and found that the presence of strong data governance capabilities meaningfully enhances the outcomes of data science initiatives. To summarize, all these studies stress the serious role of data quality in governing data to ensure accuracy, timeliness, relevance, completeness, trustworthiness, and its impact on outcomes in organizations.

Accountability and Influence on Compliance, Trust, and Transparency.

In cloud ecosystems, accountability is important, as it enhances trust and transparency in end-users of services, regulators, auditors, and business owners (Felici and Pearson, 2014; Tountopoulos et al., 2014). Accountability in organizations is a multifaceted concept with positive and negative inferences. Organizations increasingly adopting cloud computing often have a challenge to comply with data protection legislation that specifies rules on handling personal data of customers, and the accountability aspect of data governance can facilitate easier compliance with such rules (Tountopoulos et al., 2014).

To be specific, Ossege (2012) and Gersen and Stephenson (2014) caution that accountability can have both optimistic as well as bad effects on work behavior and can even lead to over-accountability, which can be detrimental. In recent years, the need for more trust in cloud service providers' ability to handle data responsibly has remained challenging. To address this, an accountability-based approach is proposed, which includes attributes, practices, and mechanisms further supported by an accountability model that underpins data governance (Felici and Pearson, 2014).

In organizations digitally transforming themselves, accountability in data governance is also emphasized (Liakh, 2021). Overall, these studies on cloud ecosystems and digital transformation in organizations emphasize the need for including accountability as a crucial construct in data governance. As shown by Hassan and Chindamo (2017), technical skills in data and business personnel alone cannot be sufficient for developing and implementing an effective data strategy. So, function like data governance can be used to put processes and associated roles that are repeatable and aligned to objectives of the business. Both Young and McConkey (2012) highlight importance of governing data in higher education sector, where often focus is on accountability and performance measures.

The advisory committee comprises key stakeholders and facilitates discussions on data quality and governance across functions. This leads to tangible outcomes such as a data collection register, a common dictionary, as well as a collaborative culture of data management. Korhonen et al. (2013) shares research on the inadequate management of issues in data along with increasing importance of governing data for managing decision rights and responsibilities related to data. The study further sheds light on design of an effective governance structure using Agile Governance Model (AGM) while ensuring proper accountability across levels and roles to enhance data governance throughout the organization. To summarize, accountability is a crucial aspect of ensuring trust, control, privacy, and transparency in organizations embracing cloud computing and digital transformation as enablers.

Importance of Data Management

Control Objectives for Information and Related Technology (COBIT) 5 plays a pivotal role in guiding leaders from operations and Information Technology practitioners (Mertens and Wulf, 2020; Mwangi, 2014). The framework is effectively used by mature

organizations to balance risk and value from data through governance. The functions of Chief Information Officers are highlighted to manage information systems, placing security through controls, overseeing data integration as well as architecture, and following established information life cycle within the COBIT framework (Mayi, 2024; Suer and Nolan, 2015). A study by Barker (2016) explores how organizations perceive data governance, highlighting its role in addressing system deficiencies. The research, drawing on a conceptual framework, identifies crucial elements for a robust data governance program, and based on an explanatory case study involving 100 professionals across 41 firms, underscores the need for systematic attention to data quality, security, and operational standards aligned with business values, emphasizing the importance of strong leadership sponsorship and a dynamic business case for success (Barker, 2016).

In response to escalating data complexity, businesses seek innovative solutions in data management, acknowledging the inadequacies of standalone approaches. Forward-thinking companies pivot to holistic data governance strategies to confront data challenges, as previous IT-driven attempts were fragmented. The rise of cloud computing also amplifies the focus on data governance, prompting specialized interest. This is where adaptive strategies in data management are required to simplify complexity along with transformative impact that cloud computing has (Al-Ruithe, 2016). Therefore, there is a trend towards developing data governance functionalities. This involves formalizing processes to ensure high-quality data in the storage domain (Tiilikainen, 2023). To achieve this, a comprehensive review of seven predictive toxicology data sources was conducted, emphasizing facets such as accuracy, completeness, integrity, metadata management, availability, and authorization (Sepehri et al., 2025). While recognizing that the discussed public data sources are mature, the paper identifies persistent gaps in establishing a data governance framework for supporting predictive toxicology (Fu et al.,

2011; Mayi, 2024). Non governance of data is a challenge with the firms having potential to create promising frameworks for accessible toxicity data repositories (Fu et al., 2011). To manage business value from data, a meticulous examination of common data management roles and the organizational coverage of these roles is required. This illustrates how the Agile Governance Model (AGM) can be leveraged to ensure necessary accountability is addressed across the enterprise at appropriate organizational levels and spectral loci (Korhonen et al., 2013). This is further operationalized by assigning decision-making rights along with accountabilities to right people to govern quality of data. As organizations increasingly invest in information technology solutions to foster business activities and adapt to dynamic environments, there are challenges to data governance in institutions within developing countries undergoing mergers or acquisitions. This often results in conflicts between the two different data management schemes of organizations getting merged resulting in accessing quality data for the merged entity a challenge. Further challenges that arise during mergers in organizations across developing countries encompass parameters that are construct data management such as data principles. Thus arises the essential for a tailored data governance framework that merged entities will have to follow to adequately manage data (Mlangeni and Ruhode, 2017).

Corporate Governance and Balance of Risk and Value

Governing data aligned with principles of corporate governance cannot be overstressed when regulators impose fines on organizations for irregularities in managing customer and financial data (Gregory, 2011). Tallon, Ramirez, and Short (2013) stress the need for data governance processes that can poise value creation with risk exposure. Executives and managers have an important role in governing data, as explored by Dahlberg and Nokkala (2015) propose a theoretical framework to govern data. Most

empirical studies explored the relationship with mixed results. There is a diverse effect of corporate governance variables on performance, with a positive relationship between return on equity and CEO bonuses and a not so favorable association between Tobin's Q ratio and CEO stock remuneration (Al Kaabi, 2022; Alanamu, 2023; Vintila et al., 2015). Building on the findings of Abata (2016) and Ragothaman (2009), characteristics of firms such as return on assets, debt ratios and magnitude of company can differentiate between well-governed and poorly governed firms. Corporate governance is important in creating value for society, and if often discussed, with a specific focus on the Indian IT sector (Moloi and George, 2024; Soti, 2019). Aspects like female presence on board, CEO/Chairman division, and experience of members on the board, have been shown to positively influence firm performance (Habib, 2016; Luciano, Nahrgang and Shropshire, 2020).

In Financial services industry, governance of data is widely explored in research (Egan, 2011; Rifaie, Alhajj, and Ridley, 2009). The challenges and applicability of data governance frameworks in small to medium-sized enterprises are examined extensively (Begg and Caira, 2012; Machado Ribeiro, Barata and da Cunha, 2022); Small and medium-sized enterprises (SMEs) may end up wasting a considerable number of resources in their attempts to realize governance of data by applying frameworks that may not be well-suited to their specific corporate environment. If this critical business sector is not adequately supported, it may lead to a reduction in wealth creation for economies that depend on SMEs. Data governance is obtainable as a discipline crucial for managing customer data, highlighting its role in increasing sales, reducing operational costs, and fostering long-term growth. Illustrated by Gregory (2011), the goal of Governance Risk Compliance and governing data is a common in managing risk while adding value to the organization. Further, there is a need for a framework that links

corporate governance, risk, compliance, with governance of data to maximize value of data asset; however, this is not empirically proven (Gregory, 2011).

In modern organizations, the interplay between governing corporate and data is one of vital aspects (Khatri and Brown, 2010). Practices that balance value creation with risk exposure are crucial to unlock value from big (Guimarães, 2019; Tallon, Ramirez, and Short, 2013). In line with this perspective, the focus has to be on the fundamental decisions and their accountability (Khatri and Brown, 2010b). The role of executives in governing data is crucial, with the governance of data considered critical to generating value for organizations (Dahlberg and Nokkala, 2015). Governing data in the financial services can be important and is underscored by a case study in Pioneer Investments, revealing that data governance is a necessity for financial services, and not having to operationalize it will decrease the competitive advantage while also exposing the organization to internal and external risks (Egan, 2011). Both domains of data governance and corporate governance are not in competition, but rather in collaboration.

Moreover, both domains aim to achieve the same goals: to guarantee the success, sustainability, and accountability. Governance helps expand on creation of knowledge in a sustainable way, to improve innovation, financial and market efficiency, and better corporate governance (Abueed and Aga, 2019). Demonstrated in the work of Pierce (2008), 58% of organizations worldwide recognize data as an asset. Additionally, Alhassan, Sammon, and Daly (2016) state that information has the equal potential to create value like any other asset. Data governance supports corporate governance by providing the required support structures to manage accuracy, security, and compliance that any organization will require for effective decision-making and thereby superior performance. Similarly, corporate governance also supports data governance by giving the necessary strategy alignment and oversight that are essential for data management and

governance integration into executives and grassroots employees equally. Therefore, it is safe to infer that effective data governance is positively correlated with an organization's effectiveness under multiple contexts.

Influences of Knowledge Management

A range of studies highlight the crucial role that knowledge management has in data governance. Equally, data literacy and management of know-how are significant in ensuring quality and thereby taking good decisions with quality insights (Witt et al., 2016). This is further supported by Panian (2010), who highlights that knowledge management is required in driving data governance initiatives and also in establishing standards and processes. From the work of Olaitan, Herselman, and Wayi (2016), the role of knowledge in governing data and information is also evident in exploring the critical success factors. These factors include a business case, a need to manage data, recognition of technology solutions, and an executive role in managing data. Researchers Begg and Caira (2012) investigated how small to medium-sized enterprises (SMEs) perceive data governance and evaluate the suitability of frameworks in data governance already available. As Organizational leaders look to leverage the available frameworks, they will need a grasp of the verbiage used to describe data, its challenges or issues, along with related infrastructure. Cohn (2015) underscores the motivational role of T.S. Eliot's quote in emphasizing effective data governance, stressing the need to transform data into actionable knowledge, asserting the importance of a robust framework to govern data in optimizing essential elements for knowledge transformation, and positioning effective data governance as imperative for organizational and community health, well-being, and advancement.

Implications on Value

Data is a valuable asset for organizations to run operational processes. Governing data is important in maximizing its value and minimizing related costs and risks. Shared data platforms further highlight the need for effectively implementing governance in immense data. It is crucial to govern data as an organizational asset and ensure that it is utilized effectively through continuous routines. To ensure value from data, it has to be managed with right oversight along with controls that can reduce risks and minimize costs (Abraham, Schneider and vom Brocke, 2019; Ribeiro, Barata and da Cunha, 2022). From value-based data governance, the major building blocks of data governance include antecedents, data scope, domain scope, organizational scope, governance mechanisms, and consequences. What is vital is defining roles of employees along with their accountabilities to manage data actively, and equally defining role of the board in overseeing governance to reduce risk Chindamo (2017). Oversight from the board is important not only to reduce the risk but also to align governance to priorities (Pike and Ll, 2019).

Managing risk directly impacts the value generation in an organization. Apart from that, aspects like having plans to communicate roles, leadership involvement, data strategy, budgetary and ownership responsibilities inline with the culture of the organization are also important for purposeful governance of data in any organization to create value Chakravorty (2020).

The need for effectively governing data is a consistently observed theme in the literature, with a focus on defining the function, observed challenges and potential value (Chakravorty, 2020; Foster et al., 2018). One can take into account multiple contextual layers namely micro, meso, and macro conditions where emphasis is on achieving equilibrium between deriving value and mitigating risk. At the macro level, regulatory frameworks and industry-specific standards like BASEL III impose overarching

compliance requirements. At an intermediate or meso level, organizations must establish to manage the value and perils associated with data by managing spends and resources effectively. At micro level, the principles of governing data will have to be applied to data operational activities (Foster et al., 2018). Companies into data intensive sectors may have to assess the impact of data governance policies on cross border transfers to ensure that productivity is not hindered (Ferracane, Kren and van der Marel, 2020).A right trade-off has to be made between enablement and restrictiveness of governing data through policy across borders, as well as in organizations.

Strategy-Focused Implementation

Often, data governance projects can be compliance heavy in large companies can be driven as major change while they also require participation from leaders, business users along with innovation (Korhonen et al., 2013). Not only in large companies, but in small and medium enterprises also, strategizing and governing data are required to address the complexities. In organizations using cloud technology, the challenges and success factors for implementing a data governance strategy. As most companies are adopting cloud, and governance is recognized in these environments, however implementation is partial. Well defined strategy using defining, evaluating and assessing critical success factors is required (Al-Ruithe and Benkhelifa, 2017). Organizations need to focus on how data governance is applied in practicality when using cloud services (Saed et al., 2018).

To translate theory into practice, six dimensions using scope, antecedents, and mechanisms of governance have been defined (Abraham, Schneider, and vom Brocke, 2019). Technology skills alone are not sufficient for an effective data strategy. This highlights the need for a comprehensive skills plan aligned with the organization's vision and purpose. The informality and underdevelopment of current data governance

practices, necessitate for research to deepen understanding and practice of implementing data strategy. Chindamo (2017) stresses the formulation of an effective data strategy that must align with the corporate goals. Seldom, as an initial step, the goals cascaded to data governance are given a taxonomical approach to clarify concepts and verbiage.

However, there is an increasing complexity and costs associated with not governing data and failures driven by IT-centric approaches (Al-Ruithe et al., 2019). The study covers both non-cloud and cloud computing contexts and moving past the siloed IT ownership of governing data that leads to failures. To implement data strategy in a better way, data governance demands a comprehensive framework that spans cloud, business participation and decision making.

Control Data to Manage it Actively

Governing data means putting necessary controls to manage risks in its operations, and balancing outcomes, thus minimizing budgets (Abraham, Schneider and vom Brocke, 2019). Six dimensions and major building blocks relate to various aspects of controls of data governance. Governing data differs from information, and evolution of information governance policies is required to balance data protection with democratized use of data.

Small to medium enterprises (SMEs) tackle the domain differently; existing data governance frameworks can be tailored for them (Begg and Caira, 2012). To add, there is importance of managing and processing big data in-memory, along with suggesting a flexible strategic IT governance framework tailored specifically for small and medium-sized enterprises (SMEs).

As stated by Paul (2013), Intel has experienced a shift in information governance from a focus on protecting data to a “Protect-and-Enable" approach. On the contrary, this shift aimed to balance the protection of data against risks while enabling valuable, though

potentially risky. What is important is avoiding excessive control measures and the need for information governance policies that both protect and enable data usage within a risk-aware environment. The value of data must be well recognized and treated with the same level of management and control as other business assets. Caution needs to be exercised in controlling use of big data as stigmatization and even after anonymization, discrimination may still exist (Evans et al., 2020). As stated by Ferracane, Kren, and van der Marel (2020), there is increasing use of data in municipalities of developed countries, for policy under the umbrella of the digital welfare state. Examining practices in Netherlands, poor quality, analytical models, ring fenced experimentation within constrained public created risks to integrity. Data and policy alternatives are needed to improve control on outcomes and usage across public.

Innovation is Important for Sustenance.

In companies implementing regulations like GDPR, there is innovation driven by leaders in data governance through the involvement of business users (M Vojvodic and Hitz, 2019). The formation of cross-functional units, and fostering sustainable organizational practices for innovation and competitive advantage is one such innovative approach. Indigenous-led networks and coalitions are working alongside the FAIR Principles to make data easier to reuse, to promote stronger indigenous control over data using data governance. Carroll et al., (2020) explore the challenges regarding Indigenous data sovereignty, focusing on the careful balance between safeguarding Indigenous rights and advancing data initiatives. They stress that using data fairly demands a thoughtful and respectful approach. The CARE Principles, developed by contributions from various groups, provide guidelines for ensuring data is handled responsibly. Similarly, researchers Abueed and Aga (2019) examine the predictive capability of corporate governance in continuous creation of knowledge in companies.

Dynamic Privacy Integration

Several studies have explored how data privacy and governance can intersect, to include these aspects into fabric of business operations (N.Maniam and Singh, 2020). Contrary to the original sectors, in autonomous cars, anonymization to protect personal data of consumers is important while getting past complexities of contracts and legal obligations while using data in Internet of Things (IOT) (Kerber and Frank, 2017). This study proposes an economic theory-based model that distinguishes mechanisms of privacy governance governed by contractual arrangements vs. those embedded within wider legal and regulatory systems that influence data ecosystems. In the evolving landscape of the Internet of Things, the emphasis is on addressing these gaps and then to develop effective data governance strategies.

The study in African countries on data privacy and governance explores the challenges arising from the digitalization and widespread adoption of digital technologies in these regions (Ademuyiwa and Adeniran, 2020). Key issues identified and addressed include challenges related to protection of personal data, the need for strong cybersecurity measures, and the importance of creating legal systems capable of regulating data use effectively. Recognizing the diversity across the continent, the authors argue for localized digital ecosystems designed to reflect the specific conditions and needs of each country.

On the contrary, in the realm of smart cities, the focus has generally shifted to controls like data privacy and data governance (Gharaibeh et al., 2017). Data management techniques are crucial for ensuring consistency, interoperable, granularity, and re-usability. The importance of repeatable data management practices cannot be less emphasized to ensure that data remains consistent, interoperable, detailed, and reusable across smart city systems. Framework has to be designed to tackle privacy and security

concerns in the management and governance of large datasets. Building on the findings of N. Maniam and Singh (2020), both public and private sectors need to prevent data leakage or misuse within the context of big data.

Lee, Zhu, and Jeffery (2017) examines privacy as well as governing data within the context of platform ecosystems. They evaluated nineteen governance models against the identified data governance factors, shedding light on gaps and limitations in current approaches. Marelli's research offers a focused examination within the realm of data privacy and data governance, particularly considering regulations in context of digital health technologies as well as big data practices. The study identifies key tensions arising between the GDPR and the surge in digital health, emphasizing misalignment with fundamental data protection principles. A central theme of the research is the call for swift and adequate policy responses. The digital health landscape is fast evolving, and there is a need to ensure the GDPR's fitness for effectively governing current developments. Specific attention will have to be provided in the critical intersection of health care, technology, and privacy regulation.

Big Data Governance

Governing large volumes of data is well-recognized necessity in modern organizations that balances value creation with risk exposure. The focus is usually on data security, privacy, and accessibility of unstructured data (Yang, Li, Elisa, and Prickett, 2019). In financial industry, large volumes of data and culture have implications on public and private governance (Campbell-Verduyn, Goguen, and Porter 2016; Campbell-Verduyn, Goguen, and Porter 2017; S. Chen et al. 2016). Similarly, Hasan et al. (2020) state that there can be an influence of big data governance in finance services organizations. While Bruckner (2018) highlights the need for appropriate regulations in using big data in algorithm-based lending to customers for fair consumption. According

to Arthur and Owen (2019), both ethical and legal considerations are important in complying in daily operations. There is a need for timely preparation, consistency, reliability, and trustworthiness to overcome challenges in managing vast amounts of data. Leonelli (2019) offers a philosophical perspective on data-centric research, arguing that our understanding of data is shifting. Instead of seeing data as static objects, this view emphasizes that the meaning and metadata of data depend on the motivations behind its usage, the tools employed to profile it, and the governance strategies that shape its active management. Data governance is crucial in all aspects of the lifecycle of data, including data collection, management, and processing in deriving insights. Big Data governance addresses challenges in algorithmic platforms and stresses the need for advanced data governance while proposing a framework that focuses on stewardship, controlled opening of data and algorithms, risk-based governance, and shared ownership (Brous et al., 2020b). There are thirteen design principles in a framework for governing big data in both individual organizations and networked organizations. A multifaceted relationship between data governance and organizational capabilities exists, which provide insights into how governance strategies provide transformation capabilities (Mikalef et al., 2018).

Stakeholder Involvement along with Influence

From 2020, stakeholders are an important aspect in evolving practices of governing data. Their involvement heavily influences decision-making and the success of data-driven initiatives in organizations. The association of stakeholders with governing data is composite, with different models and perspectives that try to capture many dimensions involved in this relationship. Within the data ecosystem, conducting stakeholder analysis is important in helping organizations understand the needs, interests, and influences of various actors (Currie et al., 2020).

Researchers, Yallop and Aliasghar (2020) examine effective processes in governing data by adopting organizational and stakeholder perspectives. The proposed ethical data framework focuses on building trusting relationships with stakeholders, thus ensuring an equitable exchange of data. In European companies, customer centricity has been identified as a factor to have a composite governance of data coupled with innovation (Vojvodic and Hitz, 2019). This emphasizes the importance of business stakeholder involvement in data compliance in organizations. In financial services, using soft systems methodology, Faezirad and Khoshnevisan (2023) researched various dimensions of access problems and identified that understanding purposeful activities and mapping them to fundamental principles of governing data reduces complexity of access. Gegenhuber et al. (2023) researched Open Social Innovation (OSI) projects and collaboration among multiple stakeholders. It is observed that for an open social innovation project to generate ideas, develop, scale solutions, and exchange data to address societal challenges, collaboration amongst stakeholders is paramount. Black et al. (2023) explores evolving landscape of governance to strategize management of data and often overlooked aspect of attention of business users. Board perspectives can be used to identify factors influencing organizations' exploration of the secondary use of data. Micheli et al. (2020) identifies four emerging models involving various participants like small and medium companies, government institutions, and civil organizations. Bozkurt, Rossmann, and Pervez (2022) reviewed smart cities and thereby emphasized the importance of data governance when many stakeholders, complex IT structures, and multiple operational processes exist. The review offers a broad dive into data governance and sets the stage for future work on building an urban data governance framework. Although different viewpoints are evident, they all share a common understanding that stakeholders are important to carry out effective data governance practices.

Market Impact and Performance

The global data models are breaking and siloed flows across borders are emerging increasing the systemic risk to the global economy. There is a need for data governance across borders to bring stabilization to global markets Arner (2022). data holders preferring contractual agreements and data re-users favoring legal rules or contracts for governing data sharing. The theory of data value chain can be leveraged to design governance as well as coalition (Trampusch, 2024). Thirteen decision domains from eight marketplaces have been analyzed to arrive at a taxonomy of decision domains like quality. This taxonomy offers valuable insights aiming to enhance their market performance and address governance impacts (Abraham, Schneider, and vom, 2023). Segalla, Stasik and Rouziès (2023) in their study highlight how markets will create commercial advantages or threats. The escalating challenges regarding data abuse, evident in fines and regulatory actions like GDPR violations, underscore the significance of ethical data handling. The article introduces the Five Ps of Ethical Data Handling - provenance, purpose, protection, privacy, and preparation. It further delves into the organizational requirements necessary for establishing a robust ethical review process. It is necessary to emphasize the crucial role of data protection systems in mitigating concerns related to the privacy of customers, illegal use of data, and information security (Chen, 2023). Proactively developing privacy systems emerges as solution to solve challenges in governing personal data. And, also positively influences both immediate financial outcomes as well as long horizon gains value in the market. Corporate governance failures among South Africa's FTSE/JSE Top 40 companies have led to serious financial consequences. In some cases, companies lost up to 73.33% of their revenue and 62 cents of market capitalization for every rand, with these findings supported by a confidence level of 99.99% (Muzata, 2022). In an increasingly data-

driven economy, effective and fair data governance has become not only a regulatory necessity, then a critical driver of market resilience and corporate success.

Need for enhanced data governance policy

Nuances of policies governing data in organizations have matured over recent years, with an increased focus on reconciling pros and cons of sharing and accessing data (Ronchi, 2022). Operationalizing policy in the right way creates copy of the truth for customers as well as financial information (Khatri and Brown, 2010). In addition, governing data requires publishing standards, as well as processes for data acquisition, usage, and management (Panian, 2010). The role of executives and managers in implementation as per policy is crucial, and good data governance is considered critical to organizations (Dahlberg and Nokkala, 2015). However, implementing data governance policy can be challenging, with issues such as tying back value, collaboration between stakeholders, capabilities, overview, practices, and politics (Benfeldt et al., 2020). The European Union Data Governance Act, adopted in 2022, has introduced new rules on data reuse and sharing, creating both advantages and vulnerabilities (Kamocki et al., 2023). Meanwhile, researchers like Ichilevici (2020) propose a multilateral consensus on data governance, emphasizing interoperability and global governance rules. Barnett (2021) provides a scan of the data regulation horizon, highlighting upcoming developments. Van Zoonen (2020) addresses the need for sound data governance in the digital welfare state and sustainable smart city initiatives, respectively. Organization for Economic Co-operation and Development (OECD) has introduced extensive efforts over the past 15 years into developing data governance principles and legal instruments to address sector-specific challenges in developing data governance policies. It provides overarching principles to unlock the reuse of diverse data types across sectors, jurisdictions, organizations, and communities (Ronchi, 2022). Even in Netherlands, Van

Zoonen (2020) critiques the emergence of data-driven social policies, termed the "digital welfare state," highlighting issues like the lack of democratic mandate, questionable data quality, and potential violations of the European Union’s GDPR. Focused on the banking sector, Faezirad and Khoshnevisan (2023) utilize soft systems methodology (SSM) to address the complex situation of data access. To formulate a policy, we must understand the situation and the fundamental actions that have taken place.

Data Analysis as an Essential

In modern technology, data analysis as a set of activities is embraced by organizations to better manage data (Martin Schader, Otto Opitz, 2000). Data analysis helps to bring out patterns and tendencies that can be used to inform decisions and strategies. Both are essential for effective data use. The public attitude towards data governance on tourism sharing platforms shows positive effects with improving quality of data and website design on attitude through data literacy self-efficacy and platform interaction, with data policy influencing data literacy self-efficacy (Jiang et al., 2023). A framework for financial institutions has to emphasize the data governance role in improving data accuracy, detailing components, corporate internal controls, data inventory, and data lineage with a focus on achieving 'good enough' accuracy (Clarke, 2019). By data analysis across front-to-back processes, one can determine data lineage and accountability, which is necessary to implement governance in the business's day-to-day operations. With most decisions being data centric, ensuring the accuracy of the data used for these decisions. There is a need for principled and interdisciplinary strategy to AI as well as DG in Latin America, highlighting the importance of legal frameworks, ethical considerations, and interdisciplinary collaboration in shaping policies for AI and data in the region (Nougrères, 2023).

Research on data governance faces several limitations, including a lack of comprehensive examination of the topic (Kvalvik, Sánchez-Gordón, and Colomo-Palacios, 2023). There is also a need for more empirical studies on data governance in shared data platforms Nokkala et al. (2019) an absence of unified perspective and foundational model. To identify maturation of data governance from its inception and the further evolution as well as future direction for governing data in an inter-organizational context this bibliometric method was employed.

Conclusion of Bibliometric Analysis

In conclusion, the bibliometric review on data governance highlights both its current boundaries and areas for expansion. Despite the extensive literature available, the task at hand is to anticipate the future trends in various disciplines. This analysis has not only defined clear boundaries for data governance but also examined previous and ongoing research trends. Through keyword clustering as well as trend analysis, the study has identified 15 factors that contribute to data governance stakeholder involvement and influence, market impact and performance, need for improved data governance policy from governments, data analysis as an essential, implication on value from data, strategy focused implementation, control data to manage, Innovation is important for sustenance, adaptive privacy embedding, big data governance to balance risk and value, data quality governance is needed for survival, accountability to influence compliance, trust and transparency, importance of data management, corporate governance to balance risk and value, Knowledge management contributes to improved governance, transparency, and strategic actions.

2.3 Theoretical Framework

Jagals, Karger and Ahlemann (2019) have done a bibliometric analysis of DG. The research trends, collaborations, and future directions on data governance have been

explored and studied in detail. In this study, 757 articles were chosen from Scopus, which has been evaluated. The research studies protection, access, AI, DM, cloud besides must be done to a larger extent by global research scholars who could give new motivation and directives (Jagals, Karger and Ahlemann, 2019).

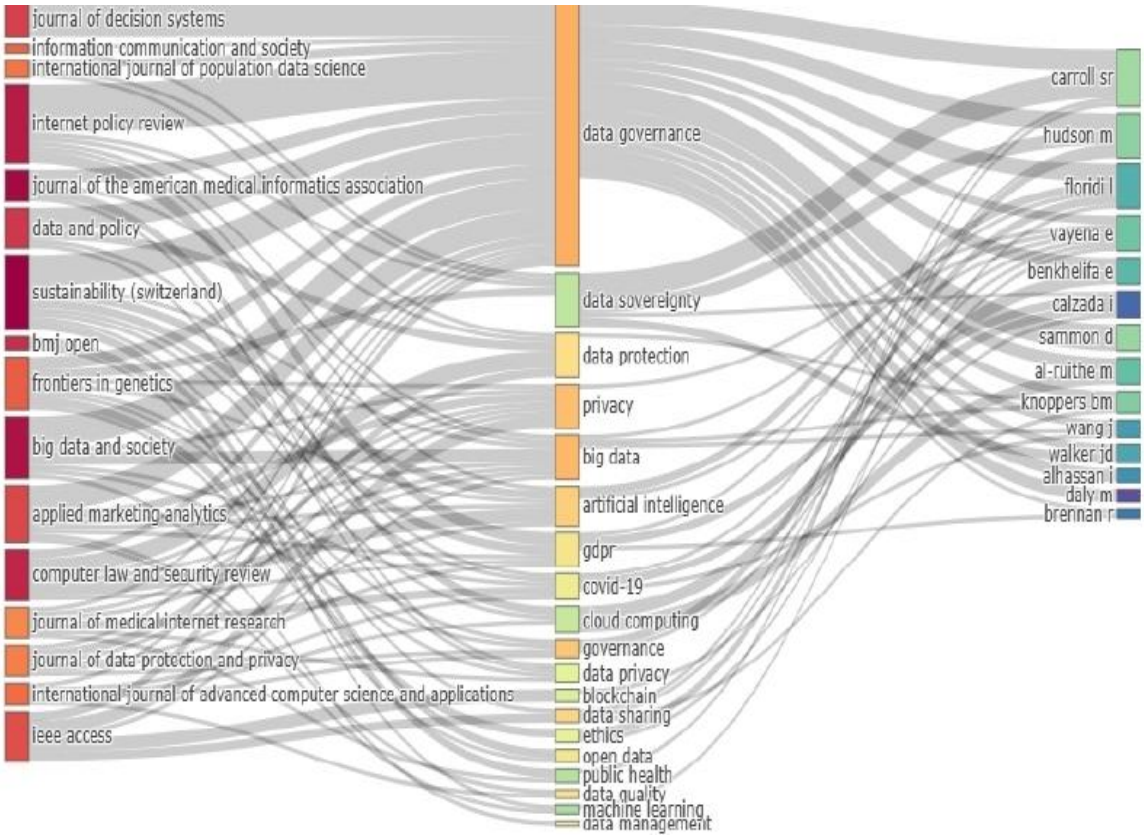


Figure 2.4
Data-related concepts researched across the literature.

Source: (Abeykoon and Sirisena, 2023)

It is evident from the above conceptual chart that the dimensions regarding data, data privacy, public health, data quality, machine learning, data protection, and data sovereignty have been researched to a larger extent. Research has not been done on theories and their implications on data governance, which is a major research gap. It is also evident from this time distribution of theories and their prominence - evolutionary

theory, contingency, structurization theory, public management theory, and institutional theory have not been researched about data governance – so more conceptual research studies on theories of data governance and its implications must be studied and evaluated as new perspectives and knowledge could emerge.

It is also evident that research studies on various theories and their implications on corporate data governance have not been studied or evaluated globally. Technology has shaped modern living as it has provided new impetus and socioeconomic development. This technology has also modified and changed corporations with technology advancements such as IoT. Data governance has been researched in the earlier section, and the emergence of corporate data governance as a sophisticated modern tool that can guide corporations towards purposive organizational functioning with efficiency and effectiveness will be modeled theoretically. Corporations must shape their policies and practices to successfully implement effective corporate data governance, treating data and its management as a central and essential part of their operations.

An effective DG model and its implementation must properly align with corporate data governance objectives that lead to economic performance. Implementing DG can also help organizations achieve competitive advantage and operational excellence. The domain of data governance as per Alhassan, Sammon, and Daly (2019), requires an emphasis on rules, regulations, procedures, policy, and administrative roles, and authority. Khatri and Brown (2010) gave a decision-making approach and framework that guided data governance for effective decision-making across the organization. There is a renewed focus on governing data, driven by the growing need for collaboration in managing data and shaping responsible practices (Al-Ruithe and Benkhelifa, 2017).

Existing Models of Data Governance

Kassen (2022) wrote a book in which the author explored and evaluated various theories of corporate data governance and its implications on stakeholders and institutions. This book is descriptive as it provides various theories elegantly and purposefully. The role of contingency theory, relative theory, and its implications on corporate data are emphasized as these aspects must be evaluated with practical implementation challenges that have not been researched, as theories have not been provided from an implementation perspective, which needs to be done. There are four emerging models, including "data sharing pools, data cooperatives, public data trusts, and personal data sovereignty" (Foster et al., 2018). Accountability in data governance is important, and an Agile Governance Model is a basis for designing a governance model (Korhonen et al., 2013). A contingency approach, highlighting effect of results strategy, organization model, and other factors on data governance can be introduced in an organization as another basis for designing a data governance model (Weber, Otto, and Österle, 2009). Yulfitri (2016a) and Wende (2007) both propose operational models, with the former focusing on government agencies and the latter on corporate data governance. Viljoeni (2021) presents a relational theory, emphasizing the population-level effects of data collection and use. Abraham, Schneider, and vom (2019) had done an evaluative and empirical study using the bibliographic method on data governance activities and their implications on research and its orientations. In this study, the various domains in which research has been conducted on data governance have been investigated. The results clearly show that data roles, data policy, data standards, data strategy, data requirements, data process and procedures, strategy, standards, and technology, along with data policies, guidelines, and requirements, have been analyzed in three major categories. All the research about data governance has been evaluated with three major components and factors: define, implement, and monitor. Basis factors that came from the bibliometric

analysis, the theories applied to corporate data governance are contingency theory and agency Theory.

It is also found that research publications have been very high on the definition of domains of data requirements, data standards, data policies and procedures, data strategy, and guidelines at the definition level only (Alhassan, Sammon, and Daly, 2019). The implementation and monitoring aspects of data roles, data policy, data standards, data strategy, data requirements, data process and procedures, strategy, standards, and technology, along with data policies, guidelines, and requirements, are medium and low in many cases. This indicates that research studies must be done on data governance, focusing on specific aspects and approaches to implement data governance in organizations to realize outcomes (Viljoen, 2021). However, it is also found that there is a need for integrative research on theories of data governance, which could lead to implementation and monitoring aspects which has not been done before. Applying new theories from the perspective of organizations could provide new dimensions, approaches, and strategies for data governance and implementation along with monitoring by giving specific theoretical inputs.

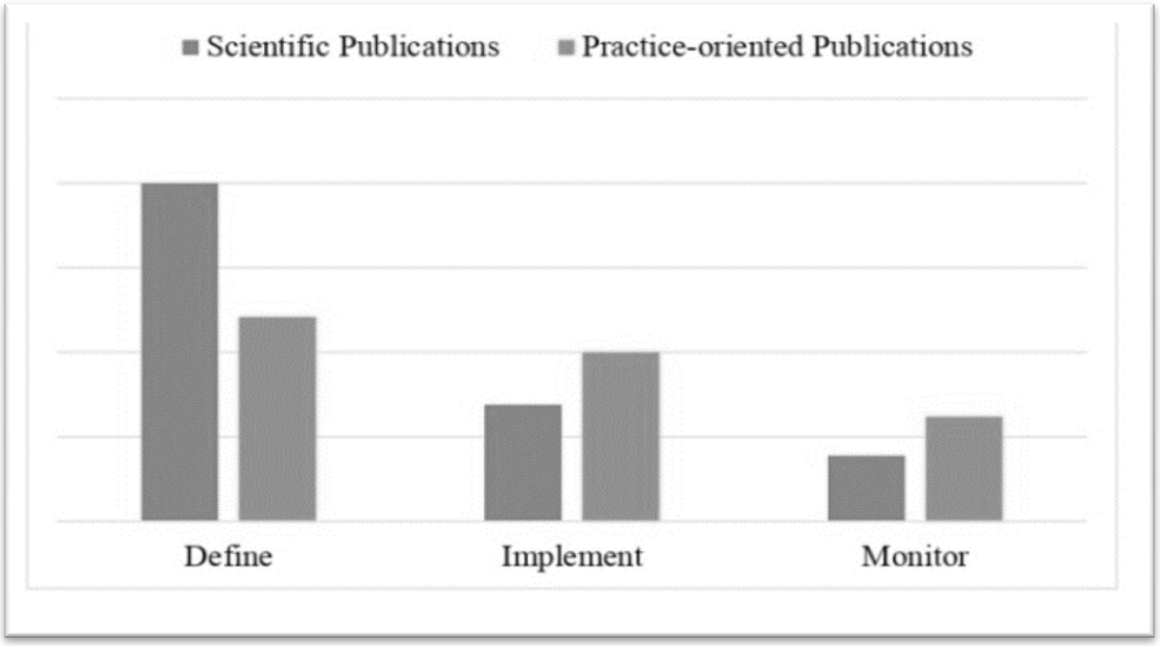


Figure 2.5
Scientific publications Vs practice-oriented publications on data governance

Source: (Alhassan, Sammon, and Daly, 2018)

It is evident from the above chart that in Data governance scientific publications have been more on defining aspects whereas in implementation and monitoring aspects practice-oriented publications are more. This shows that there is a need for more theoretical orientations and conceptual formulation-oriented studies in data governance. There is a need to provide more theories on data governance which can give new thoughts and extend the frontiers of knowledge on this subject. This can also give new dimensions of thinking which can inspire academicians and professionals in this field to do more theoretical studies which is the need of this hour.

Furthermore, governing data improves analysis of data to the extent needed, which often does not occur to the extent needed. Furthermore, data governance improves the management of data to the extent it is needed, which often does not occur to the extent needed. Nedelchev (2018) performed bibliometric study on various theories and

their applications to corporate governance in Organizations. This study was done from 1996 to 2016. In a bibliometric study by Nedelchev (2018) publications from SSRN have been taken and the analysis has been done with global researchers on the application of various theories for corporate governance, 2322 publications were evaluated and analyzed.

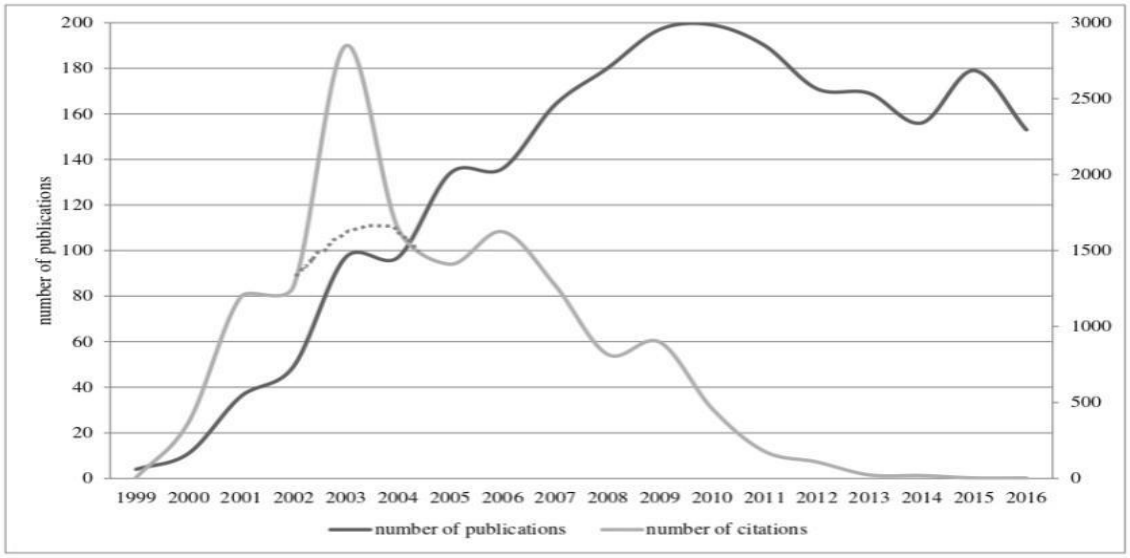


Figure 2.6
Corporate governance from 1996 to 2016

Source: (Nedelchev, 2018)

Number of journals regarding corporate governance has increased from 1996 to 2016 as the number of citations has also gradually decreased over this period.

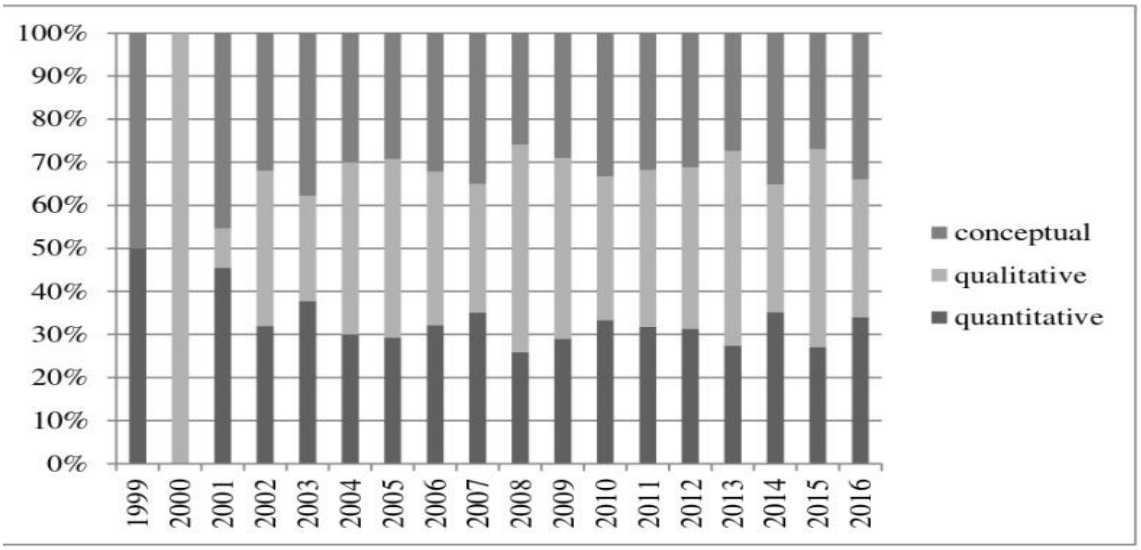


Figure 2.7
Theory analysis on corporate governance

Source: (Nedelchev, 2018)

Corporate governance research has largely been evaluated on a conceptual basis between 1996 and 2016. However, very little quantitative and qualitative research has been conducted to evaluate these theories. Therefore, this review aims a conceptual framework by evaluation and using specific applicable theories. Other theories of prominence:

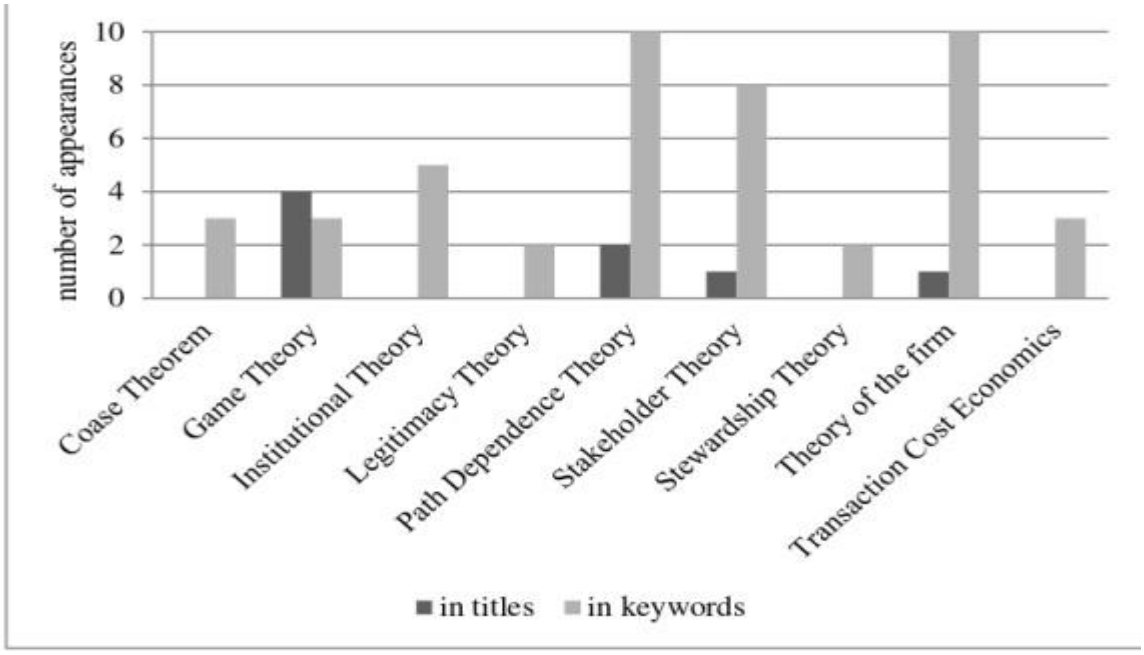


Figure 2.8
Theories of prominence as per their usage in literature

Source: (Nedelchev, 2018)

It is also evident from this research paper that the theories chosen in this study like evolutionary theory, contingency, Structurization theory, public management theory, and institutional theory have not been researched or evaluated by research scholars and their applications on corporate data governance are yet to be empirically proven which is attempted with this study.

Time distribution of top ten theories:

								Stakeholder Theory			Theory of the firm				Transaction Cost Economics		
					Theory of the firm		Theory of the firm	Path Dependence Theory			Stakeholder Theory				Theory of the firm		
					Stakeholder Theory	Stakeholder Theory	Stakeholder Theory	Organization theory	Stakeholder Theory	Path Dependence Theory	Reputation Games					Stakeholder Theory	Theory of the firm	Theory of the firm
	Path Dependence Theory		Information Asymmetry	Transaction Cost Economics	Path Dependence Theory	Reputation Games	Path Dependence Theory	Information Asymmetry	Information Asymmetry	Institutional Theory	Information Asymmetry		Transaction Cost Economics	Theory of the firm	Path Dependence Theory	Legal origin theory, path dependence	Institutional Theory
Agency Theory	Agency Theory	Agency Theory	Agency Theory	Agency Theory	Agency Theory	Agency Theory	Agency Theory	Agency Theory	Agency Theory	Agency Theory	Agency Theory	Agency Theory	Agency Theory	Agency Theory	Agency Theory	Agency Theory	Agency Theory
1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016

Figure 2.9
Time distribution of theories and their prominence
Source: (Nedelchev, 2018)

It is also evident from a time distribution of theories and their prominence that evolutionary theory, contingency, Structurization theory, public management theory, and institutional theory have not been researched as it has not assumed prominence among global research scholars (Nedelchev, 2018). This research aims to shed light on theories that have not yet been applied conceptually. Doing so could lead to new findings and contributions to both the research community and industry.

Contingency Theory Approach to Corporate Data governance

The word contingency would mean situation, and situation-based approaches or dynamic theories that contribute to corporate data governance have not evolved. Wende (2007) had first provided this dimension of contingency, which has given new focus and approaches. This has also redefined the way we look at and organize corporate data governance. In this study, it is stated that there is a need for effective organizational restructuring that leads to corporate data management practices. There is a need to effectively manage the critical factors that lead to data quality management systems. Professionals who are engaged in this corporate data governance must integrate and assimilate with Information Technology (IT) business professionals. This research indicates that three major factors that lead to effective data governance are quality data, decision-making-related issues, and responsibility-related issues. There is a need for effective integration of IT, quality as well as data management which needs to be researched and evaluated and can give new theories and orientations on corporate data governance and administration. This is identified as a research gap in these studies.

Understanding corporate governance requires one to understand the charactestics of organizations like return on assets, firm size, debt ratios, and auditor opinion, that shape governance mechanisms (Ragothaman and Gollakota, 2009b). Governance mechanisms are also shaped by legal position, property structure, and the interests of the

body (Le-ping, 2003). Research by Vintila et al. (2015) examined nuanced effects of corporate governance on monetary outcomes revealing positive effects between return on equity and CEO pay, and a negative relationship between Tobin's Q ratio and CEO share-based pay. Some factors like female board members, CEO duality, as well as board member experience, positively influence firm performance (Habib, 2016).

Critiques have been raised against the assumptions of data governance research, organizational management as well as corporate governance, as they relate to environmental context, performance, rational actors, and design parameters such as the structure of a firm (Negandhi and Reimann, 1972; Wende and Otto, 2007; Weill and Olson, 1989). However, the context factors and design parameters derived from earlier studies have been borrowed from studies on IT governance and have not been analyzed for impact on the model's performance to influence the organizational outcomes. Several studies have explored the idea of a contingency-based data governance model, highlighting the need for flexible approaches that can adjust to different organizational contexts and environmental conditions. Fframeworks must take into account the impact of context factors such as performance strategy, organization model, and decision-making style (Weber, Otto and Österle, 2009; Wende and Otto, 2007).

In the 1950s, Contingency theory arose as a response to earlier management theories that focused solely on one approach to organizing and controlling management. It's important to keep in to find a singular model to manage and govern data that can be applied to every organization. The model should be tailored to suit the specific contextual factors, such as their operating environment, market, and the kind of technology used (Negandhi and Reimann, 1972). A contingency theory of organization focuses on two types of variables (e.g., environmental variables impact the structure of an organization and effect of nested arrangement on the outcomes of the organization) (Weill and Olson,

1989). Thus, it is deduced that there is a relationship between organizational characteristics, such as structure, and organizational effectiveness that is determined by contingencies. However, the drawback of studies is the underlying assumption of fitment between contingency variables, Information management function, its performance, and organizational performance, which is further analyzed deterministic model that portrays only causal relationships between the above variables. A probabilistic study using more information available from companies would have unearthed probable causation as well. Another limitation is that though data management during this point in time is not yet mature, it is assumed that the data management process is well determined, and an idealized data management process is being described.

Most studies on how businesses are managed have looked at different things that can affect how they are run. This has been studied by many different groups Aguilera and Jackson (2003), small and medium organizations Anheier and Baums (2020) and Organizations in various life-cycle phases, including those that are not mature (Lynall et al., 2003). The principles of corporate governance research on contingency factors that can apply to data governance-

- Enterprise size
- Environment in which the organization operates
- Cultural differences
- National and geographical dissimilarity
- CEO tenure, attributes, and background

The theory of contingency traditionally focuses on how well the organizational structure aligns with the external environment (Elgharbawy and Abdel-Kader, 2021). Contingency theory was further developed by scholars who focused on the internal conditions of an organization, such as its level of structural formalization and

specialization, as contingencies, in addition to the fit between the organization and its environment (Miller, 1992). Researchers identified factors dependent on data governance. However, they did not explain how these factors impact the performance of an organization or the archetypes of governance. There are two significant domains in my research on data governance, and to summarize, I would like to present my conclusions: the structure of data management and the placement of decision-making bodies or roles. Building on their findings, the way data is governed can be influenced by contingencies, and every organization needs a unique data governance configuration to suit its specific requirements (Weber, Otto, and Österle, 2009).

Further, the contingency factors that have been researched earlier to have an impact on data governance are –

- Organization Structure
- Organization size
- Competitive strategy
- Corporate governance
- Decision-making style

Contingency Data Governance Model

We will refer to Data Governance (DG), Corporate Governance (CG) and Organizational Performance (OP) across multiple aspects of defining the theoretical model. The research highlights the relationship between domains of DG, CG, and institutional results, and it is understood that there isn't a theoretical model, which is a research gap. Basis the findings from the bibliometric analysis, fifteen factors have been identified for DG, while from the literature review, seven factors have been identified for CG and four factors for Organizations' performance. As the relationship between organizational structure for DG and an OP is established through the literature review, a

contingency-based research model for data governance is proposed. The model comprises several factors, including contingency factors, design parameters, and outcome parameters.

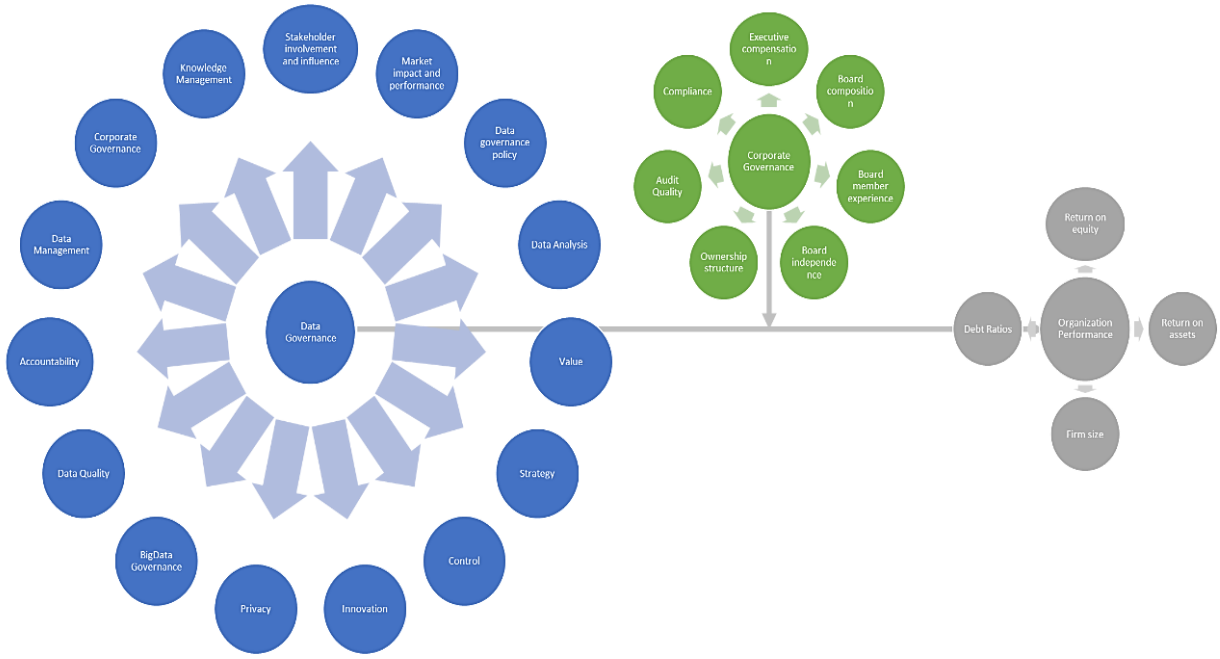


Figure 2.10
Contingency-based theoretical model for DG

Sustainable ways to govern data are the ones that actively manage acquiring, retaining, utilizing, preserving, updating, managing, or erasing financial and accounting data throughout its lifetime (Abueed and Aga, 2019). The implementation of DG can lead to improvements in the pertinence, entirety, availability, distribution, and excellence of data (Liakh, 2021). To conclude, we have established a direct relationship between data quality and DG (Alhassan, Sammon, and Daly, 2016; Bozkurt, Rossmann, and Pervez, 2022; Brous et al., 2016; Fu et al., 2011; Ramadhan et al., 2021).

A significant portion of the studies related to financial reporting quality are conducted in the United States and China, relying primarily on secondary data. Unfortunately, this data may not provide sufficient information since it often involves the

use of proxy variables (Ababneh and Aga, 2019). It can be concluded from a study of Jordanian organizations that sustainable financial DG does not promote creative accounting practices, while such practices are inferred to reduce the quality of financial and accounting information. To maximize the value of financial information to the organization, DG practices aim to ensure data quality, control, and protection (Tallon, 2013; Mikalef and Krogstie, 2018; Tallon, Ramirez, and Short, 2013; Randhawa, n.d., 2019). Moreover, DG broadens the scope of IT Governance by considering data quality aspects in reporting on accounting (Heiß, 2011). Governance over data is a critical factor in ensuring compliance procedures like International Financial Reporting Standards (IFRS) again associated with accuracy of fiscal reporting. Such DG mechanisms should focus on the accuracy and currency of financial reporting in organizations (Stead, 2017). Organizations must know the relationship between data quality and reporting tools. In addition, they must know the impacts of poor-quality data on financial reporting and users' trust. Business intelligence products, namely impressively prepared reports, and analysis, naturally attract more attention than data cleansing. Unfortunately, that sometimes leads companies to overlook data preparation problems like data being appropriate for reporting in favor of faster project results. The right data quality not only lowers costs (e.g., reducing data cleansing outlays), but reliable data is also valuable to generate revenue. Investors have more confidence in enterprises that publish timely information when making decisions based on external reporting. Some problems of quality are common with organizations that focus on mergers and acquisitions as maintaining an enterprise-wide data model cannot always be effective and easy. Also, such problems are common with heterogeneous organizations and constantly need to integrate with a single ERP system. Moreover, certain standards like the International Financial Reporting Standards (IFRS) represent quality assurance measures in reporting.

As part of an overall Total Quality Management approach, one should integrate data quality KPIs into a wider context, for example. Total Data Quality Management (TDQM) or Total Quality Data Management (TQDM). Controller of data is familiar with business accounting concepts and can be the driving force along with participation from all businesses and functions to provide reliable and qualitative financial reports.

The direct costs, brand damage, and missed opportunities resulting from inadequate governance of data and breaches in customer data are significant for corporations (Gregory, 2011). This over-governance can limit data-led innovations and encourage users to bypass policies, leading to unnecessary risks with their data and a decrease in performance (Abraham, Schneider and vom Brocke, 2019). DG addresses intricate problems such as enhancing data quality and creating a unified customer view at an enterprise level (Panian, 2010). Effective DG is a strategic imperative for organizations to improve performance (Pfahlsberger and Mendling, 2021). Implementing DG can lead to better utilization of data, which in turn can increase sales and customer spending. DG positively impacts the utilization of data, which in turn increases sales and customer spending. Proper DG positively impacts data utilization, resulting in increased sales and customer spending (Mikalef and Krogstie, 2018).

Organizations need to treat DG as just as important as IT governance, making it a key part of their overall CG framework (Traulsenand Tröbs, 2011). The first step to effectively managing data is to establish a DG structure that is an oversight function that aligns with the culture of the organization. The determination of DG structure can be influenced by certain characteristics. For example, whether an offensive strategy is adopted to monetize data insights and improve sales, or a defensive strategy is adopted to ensure disclosures and data compliance (Lancaster et al., 2019). Illustrated by Wolf (2002) governance is a process that takes place in flatly structured systems, which

involves the participation of both formal and informal entities. It is challenging to eliminate power disparities among actors in governance phenomena (Micheli et al., 2020). Effective data management structures can be utilized to manage conflicts between IT, business divisions, or boards of directors.

When it comes to DG, how ownership is dispersed is an important factor to consider. Scholars have identified three common ways organizations distribute accountability: centralization, federation, or decentralization (Otto, 2011). In markets that are highly regulated, a centralized organizational structure is typically necessary, as compared to markets with fewer or no regulations (Wende and Otto, 2007). As per contingency theory, other outside factors that can affect things include how much the market goes up and down (Otto, 2011), the industry the Organization operates in (Dreibelbis, 2008; Otto, 2011; Tallon, 2013), and the country the Organization is in. To sum up, there is a clear relationship between the formality of a DG structure and the stability and certainty of the market and environment in which it operates. Demonstrated by contingency theory, organizational performance can be improved by ensuring a strong alignment between contingency variables such as context factors and DG structure. The theory suggests that the better the fit between these variables, the better the performance of the organization.

When decision-making is decentralized, business divisions have the freedom to create data products or management information systems (MIS) that cater to local needs and align with their priorities. Aligning different departments towards a common goal, such as maintaining high-quality financial data, is known as coordinating decision-making. It is necessary to plan and coordinate extensively and to respond formally to events that require the exchange of information to manage accuracy and verbiage of regulatory reporting. The situations have an impact on how data management and

governance units, and data management can be provided as a service. Encouraging coordination and collaboration among sub-units and the organization is essential for ensuring efficient services while respecting their autonomy in decision-making (Castañer and Oliveira, 2020).

In environments that undergo frequent changes, organizations tend to distribute decision-making power. On the other hand, stable organizations tend to centralize decision-making power (Lawrence and Lorsch, 1967). The authors argue that in stable environments, a decentralized approach may be less effective, and a centralized approach can offer better benefits. They contended that for an organization to succeed, it must ensure that its internal structure is aligned with the requirements of its external environment. In simpler terms, they emphasized the importance of establishing a "fit" between the two.

The DG leader needs to have oversight of the daily operations of the data operations (Loshin, 2009). The individual who is employed to manage data is responsible for ensuring that data is acquired, modeled, delivered, and maintained properly, as well as overseeing compliance with data policy. To address the issue of low engagement, most companies utilizing big data are formalizing function of Chief Data Officer (CDO) driven by optimizing potential value of data. One of the important benefits of having CDOs in the executive team is their ability to participate in improving performance (Nie et al., 2019). In some scenarios, it is noted that the stock market responds favorably to news about newly established CDO positions (Nishant et al., 2020; Xu et al., 2016). Ultimately, a CDO with significant experience and visibility within the C-suite is well-positioned to deliver a sustainable data strategy that extends beyond tactical program gains.

The review of literature identified five key themes in DG that influence organizational performance, particularly when viewed through the lens of contingency theory. Applying design parameters aligned with relevant contingency factors can help organizations build an effective and tailored DG strategy.

***Ownership dispersion* –** placement of decision makers as well as owners for data-based activities (Nishant et al., 2020).

***Data governance structure* –** centralized, decentralized, or hybrid models along with defining accountabilities, responsibilities, and roles.

***Data management as a service* –** Establishing subdivisions within the realm of data management, accompanied by evaluation, guidance, and supervision provided by DG, can enhance oversight and facilitate a more rapid reaction to autonomous data incidents, such as security breaches or conflicts in policies. This approach fosters innovation and strengthens the ability to manage firm's data effectively.

Agency Theory Approach to Data Governance

Earlier research tried to examine the key drivers of data management decisions through DG. However, the impact of these DG decisions on outcomes of the organization is not well understood. This literature review highlights the relationship between domains of DG, CG, and OP, however, there is a lack of a theoretical model, which is a research gap. Hence, we developed a DG agency model that stitches drivers of decisions into outcomes. Companies have allocated substantial financial resources and will have to invest more into data while treating it as enterprise asset. It has been found that agency theory has been used to a very large extent across organizational contexts, and its prevalence has been more prominent, as stated in the chart below:

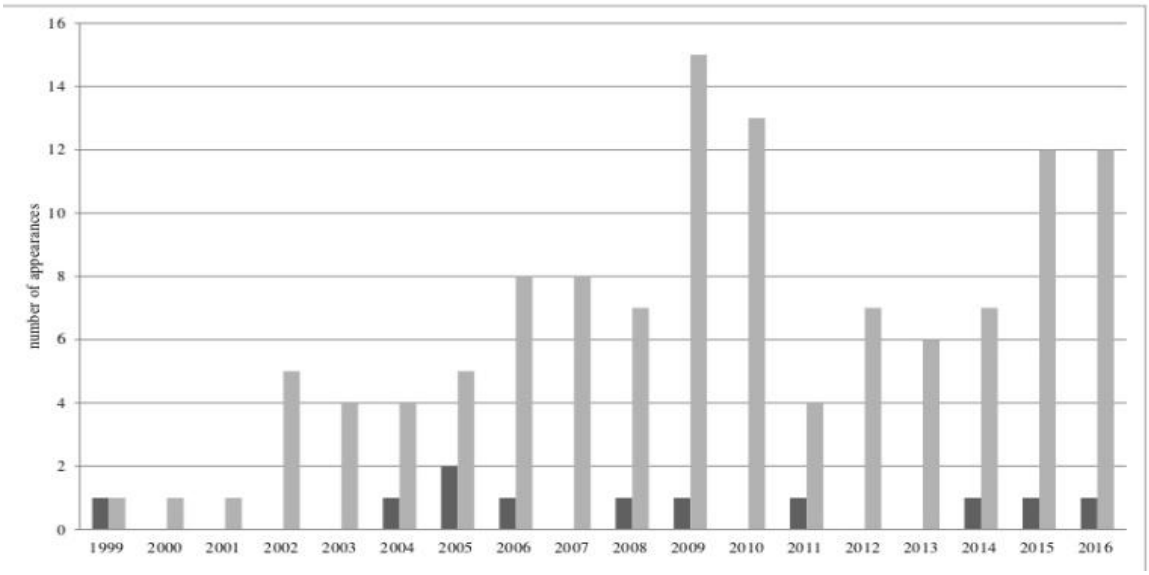


Figure 2.11
Application of Agency theory across research over time

Source: *(Nedelchev, M., 2018)*

Agency theory is a significant theory that is used in both management and governance, focusing on relationships between owners and company management. Often, it is said that the interests of owners of organizations can differ from the goals of managers who make investment decisions. Let's say goals of owners and the managers do not match; it can cause a significant gap, and increase costs to monitor managers. The same theory and principles can be applied to corporate DG as well (Fama and Jensen, 2019; Nedelchev, 2018).

- **Importance of Agency Theory**

Researchers differ in pointing to origination of Agency theory, while institutional frameworks are attributed to Mitnick (1974;1975), and the economic theory of agency is attributed to Ross (2012). Both perspectives are important in organizational structures. Agency theory highlights how monitoring mechanisms, compensation structures, and performance-based contracting change the behavior of managers toward excellence. The economic theory of agency views organizational mechanisms to be an incentives-

dominated system in a way that compensation and monitoring approaches can result in perfection of performance from the perspective of the principal (Mitnick, 2021). In the context of the organization, agent-principal relationships are usually abstracted and generalized in the theory of agency. Eisenhardt (1989) argues that agency theory helps navigate two major issues: misalignment of goals between agents and principals, and the difficulty of verifying agents' actions. (Shen et al., 2022). Apart from self-interest, agency theory also explores how expectations of duty and underlying motivational drivers influence interactions between agents and principals. In addition, it is not a theory of isolated decisions and who makes them. Instead, it is one rooted in relationships embedded in social structures characterized by social norms that shape them and are shaped by them in turn. The effectiveness of stakeholder monitoring goes beyond boards of directors and capital providers (Ormazábal, 2018). Data oversight is central to effective DG, as it reinforces standards of quality, improves regulatory alignment, and enhances stakeholder confidence (Brous and Janssen, 2020b). Agency theory, which explores the delegation of tasks from principals to agents, has been applied to various aspects of DG. In public sector, role of state legislature and Information Technology (IT) steering committee in fostering governance has been highlighted (Dawson et al., 2016). It's more relevant in the context of Within governmental institutions, the need for a well-defined operational model and structure makes the application of DG effective (Yulfitri, 2016). Execution of agency theory principles in DG was disputed earlier for assuming rationality and information conditions (Linder and Foss, 2013). Research in agency theory should, however, explore the nature of agency monitoring, relationships, and incentive alignment (Henry L. Tosi, 2008). Using the perspective of agency theory can enhance our understanding of CG in organizations, particularly regarding ownership, board composition, and executive compensation (Filatotchev and Wright, 2011a). A

range of studies have examined the reduction of agency costs in CG. As studied by some researchers, including Maurović and Hasić (2013), importance of CG and managerial ownership comes in reducing such costs of oversight. The importance of boardroom culture in CG has been highlighted by Parker (2007), and need to consider informal characteristics such as knowledge, values, and collaborative thinking when selecting board members (Maharaj, 2008). Role of employees in CG is increasingly important in knowledge-intensive organizations and economies (Muthusamy, Bobinski, and Jawahar, 2011). Having formal roles in CG is important to ensure transparency, integrity, and risk management are embedded (Jan and Sangmi, 2016). During financial crisis, contracts played a crucial role in CG. Some scholars have contested the theoretical assumptions of the contractarian theory of CG Klausner et al., 2016), while some scholars argue for an increased emphasis on trust over contracts (Styhre, 2016). The role of corporate policy in advocating social responsibility and ethical behavior has also been emphasized (Buono and Nichols, 1985). Researchers like Hirsch et al. (2019) and (Loi, Wong, and Lee, 2019) both emphasize the need for clear ethical guidelines and frameworks in data-driven businesses, highlighting the challenges and emerging governance frameworks in practice. The relationship between principals and agents in organizations is complex and can lead to a range of outcomes, including conflict and cooperation. Different perspectives on conflict management in organizations, such as the neoliberal egoist, critical, unitarist, and pluralist perspectives, can shape the goals and assumptions of conflict resolution (Roche et al., 2014).

- **Agency Theory Data Governance Model – Theoretical Model**

In organizations and societies in general, agency relationships are prevalent in formal roles, as well as in more informal behaviors such as altruism and helping. The study of agency finds similarities among seemingly diverse contexts like employee-

manager, lawyer-client, and director-shareholder relationships, as well as caretaker-patient relationships (Mitnick, 2021). The same can be applied to data management governance as well. In the study of the Agency theory of CG, assessment plays a vital role in generating incentives, influencing contractual relationships, and affecting firm performance (Hermalin et al., 2017).

A range of studies have explored the reduction of agency costs in CG. Research on informal behavior in CG highlights the importance of boardroom culture (Lee, David Parker, 2007) and the need to consider informal characteristics such as knowledge, values, and groupthink when selecting board members (Maharaj, 2008).

Table 2.1

Research on agency theory to identify factors for DG

S. No	**Factor**	**Research**
1	Assessment	(Hermalin et al., 2017); (Tamburini 2016)
2	Monitoring	(Ormazábal, 2018); (Henry L Tosi, 2008); (Filatotchev and Wright, 2011b)
3	Reduce expenses to verify	(Maurović and Hasić, 2013) and (Singh and Davidson, 2003)
4	Internal Behaviors	(Lee D Parker, 2007)
5	Formal roles	(Muthusamy, Bobinski and Jawahar, 2011); (Jan and Sangmi, 2016)
6	Contracts	(Möslein, 2009); (Klausner et al., 2016); (Styhre, 2016)
7	Policy to formalize structure and roles	(Buono and Nichols, 1985); (Royaee and Dehkordi, 2013)
8	Overcome stress lines with	(Hirsch et al., 2019); (Loi, Wong, and Lee,

	Data Ethics	2019)
9	Goals of principal and agent	(Valentine, Hollingworth, and Schultz, 2018); (McNicol, Carthouser, and Abeysooriya, 2024); (Mukherji, Wright, and Mukherji, 2007); (Budd and Colvin, 2014)

Organizational policy plays a crucial role in CG by providing direction and rules to guide the behavior of employees in the organization (Varalakshmi and A, 2017). Various academic works have focused on intersection of data ethics and organizational practices. The relationship between principals and agents in organizations is complex and can lead to a range of outcomes, including conflict and cooperation (Mukherji, Wright, and Mukherji, 2007).

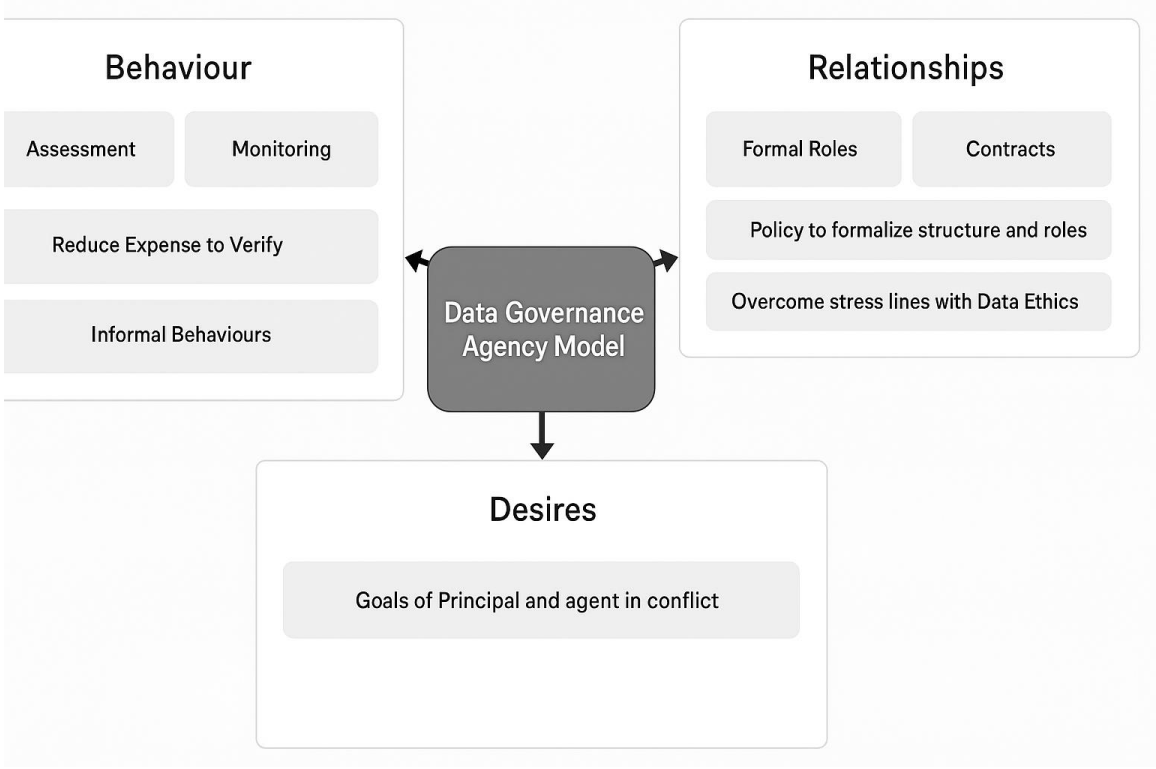


Figure 2.12
DG framework based on Agency theory of CG

As shown by Mitnick (2021), agency theory covers more than use of incentives i.e., incentives relations that are significant in organization dynamics. Along with decisions, the theory also involves relationships of control from the owners. Additionally, the theory does not look at how to approach perfection most efficiently, but rather how to deal with inevitable imperfections practically. The analytic and rigorous nature of agency theory arguably makes it an attractive tool for decision-making in complex, practical situations (Pouryousefi and Frooman, 2017). An analytical method that identifies major stress lines within economic interactions; organizational ethical codes then serve as the glue that keeps things together (Heath, 2009). Ethical principles in this top-down organizational setting express commitments on the part of agents to reduce risks that they impose on principals.

The performance of organizations in terms of financial performance is considered an outcome in the above research model. This Literature review considers DG as the control mechanism that determines accuracy of accounting reports and thus financial outcomes. To start with, researchers, including Klai and Omri (2011) and Rahman et al. (2018) identified the impact of financial data and information reporting quality on CG has been studied. Similarly, in Tunis, Klai and Omri (2011) examined organizations' link between CG (i.e., board of directors and the ownership structure) and the quality of financial reporting of twenty-two organizations and identified positive relation. Audit is also an efficient control mechanism to monitor the managers while ensuring the integrity of financial reports (Fama and Jensen, 2019; Jensen et al., 1976; Watts and Zimmerman, 1983).

While there are benefits to having an effective audit committee, there are also drawbacks. One such drawback is that audit committees can be costly. In addition, audit committees can also be time-consuming, which can take away from other important

duties that board members may have. The study of 119 Indonesian companies by Putri and Prasetyo (2023) found no clear influence of CG on earnings management. In other words, CG does not seem to affect the quality of earnings management in Indonesian organizations. The estimation results showed that the interactive effect of executive compensation and CG has a significant and negative influence on discretionary accruals. This indicates a positive relationship between CG and reporting quality in Nigerian organizations. Similar studies include Li et al. (2018) and Petra (2007) or American organizations, (M.E. Bradbury, 2007) Singapore and Malaysian organizations suggested that the CG mechanisms (i.e., independent directors) are not sufficiently competent to control the managers and their presence on the board does not affect reporting quality in the presence of information asymmetry.

Second, several authors underlined that scale of board of directors can be associated with a good quality of financial reporting. A reduced size implies a high degree of coordination and communication between them and the managers (Fama and Jensen, 2019). Strange finding by researchers Vafeas (2000), as well as M.E. Bradbury (2007) include sighting reduction of information on incomes when sizes of board is large and improved financial outcomes in American, Singapore, and New Zealand organizations. On the other hand some researchers observed that increasing number of directors ensures value relevance of accounting statements Effat A. Tahat et al. (2021) in contrast some did not ascertain the link (Firth et al., 2007).

Firm's outcomes can be influenced by risks associated with data, information, as well as operating environment (Hutchinson, 2001; Larcker et al., 1997). Executives must evaluate the significance and dependability of the extensive and diverse data sets, which include performance reports, in the context of divisions, and from the views of various stakeholders. This is crucial for making informed decisions (Laud and Schepers, 2009).

Managing large amounts of data can become more manageable and efficient with the implementation of a formal DG function. This approach can lead to sustainable knowledge creation and growth. Building knowledge over time is a key factor that can predict information transparency, financial performance, market performance, and innovation. This is closely linked to the company's governance practices. Pierce (2008) states that 58% recognized data as a strategic asset. Further, Li (2018b) has highlighted the impact of data quality used for financial reporting. There is impact of inside and outside governance methods, such as manager pay and the corporate takeover market, respectively on financial performance.

2.4 Summary

The bibliographical analysis of DG literature reveals clear scope and boundary with fifteen keywords that have been arranged as per an evolving timeline from 2011 to 2024 - stakeholder, market, policy, data analysis, value, strategy, control, innovation, privacy, big data, data quality, data management, CG, knowledge, and accountability. After having the review the literature, the key factors of evolution have been deduced as stakeholder involvement and influence, market impact and performance, the need for improved DG policy from governments, data analysis as an essential, implications on value from data, strategy focused implementation, control data to manage, innovation being important to sustenance, dynamic privacy integration, bigDG to balance risk and value, data quality governance needed for survival, accountability to influence compliance or trust and transparency, CG to balance risk and value, knowledge management influences control or accountability and decision making. To create a new theoretical yet implementable model for DG in organizations, contingency theory and agency theory have been selected and applied as theories. A new theoretical model has been developed based on these theories and tested for DG. The model can assist in

planning data management practices, aligning information flow, and addressing the critical existing challenges. It can also help in policy management and frameworks. A proper information system could be created by effectively combining corporate DG practices. However, theories are minimal in these aspects, and it is necessary to derive and apply them in business situations, which is the need of the hour.

CHAPTER III:

METHODOLOGY

3.1 Overview of Research Problem

Interplay Between Corporate Governance (CG), Data Governance (DG), and Organizational Performance (OP) is centered on how these governance systems affect the measures of performance of organizations. Organizations face complex environments where source-to-relationship management and information management governance models matter most, particularly given the growth in regulations, digitization of organizational services, and centrality of data in decision-making.

Data management aims at the standardization of data and its protection to enable it to be a tool for the daily or strategic functioning of contemporary institutions. Organizations are exposed to risk factors such as non-compliance, data and application breaches, and operational dysfunction if an adequate data management framework is not established. On the other hand, CG gives frameworks, which incorporate rights and responsibilities, structures for decision-making, ethical standards, and effective accountability systems in organizations to the corporate decision-making process and determinants of organizational competitiveness and stakeholder confidence.

The research problem as such poses a question about what is still missing or what complementary measures should be taken so that the two types of governance models—data and corporate—can be effectively used to improve the performance of organizations. More precisely, it explores how embedding sound DG into CG systems can enhance compliance and risk management, innovation, and overall strategic flexibility. Further, long-term strategic development, competitive differentiation, and customer satisfaction as

factors define the success level of organizations operating in the exceedingly competitive and stringent financial environment.

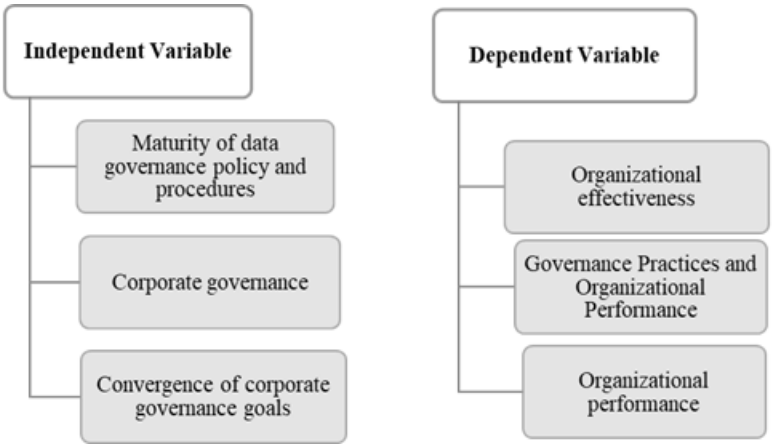


Figure 3.1
Theoretical Framework

Variables in the Study

The term "variable" refers to an element in research that has the potential to change and so impact the findings. Many times, ideas are named variables in research. Definition of a variable is anything that can be changed. In this study, two separate types of variables are employed.

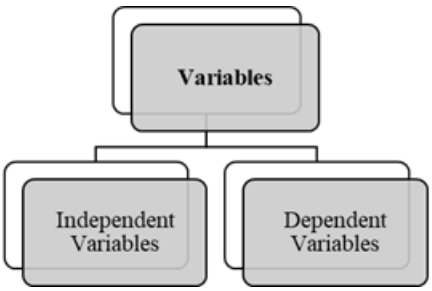


Figure 3.2
Types of Variables

- **Independent Variable**

An independent variable is a factor that researchers intentionally manipulate and observe its outcome on the dependent variable. In this study, the independent variable

- Maturity of DG policy and procedures
- CG
- Union of governance goals

- **Dependent Variable**

A dependent variable is the result or effect that researchers want to quantify or predict in a study. It is affected by alterations in the independent variable(s). In an experimental or observational study, the dependent variable signifies the phenomenon under examination or assessment. OP serves as dependent variable, anticipated to fluctuate by the deployment and sophistication of DG methods. Comprehending the dependent variable is essential as it aids in assessing the overall influence and efficacy of the elements under investigation. The study focuses on the dependent variable of "Organizational effectiveness, Governance Practices and OP and OP".

Survey Administration

The online questionnaire was shared with eligible participants via email, leveraging professional networks (including DAMA mailing lists and LinkedIn groups) as well as direct corporate contacts. The communication outlined the research goals, ensured confidentiality, and requested responses within a three-week window. In line with Fowler (2014), two reminder emails were sent to boost the response rate.

Ethical Considerations

- **Informed Consent**: A digital consent form appeared at the start of the questionnaire, explaining the study's scope, data usage, and participants' right to withdraw.
- **Confidentiality and Compliance**: No personal identifiers were processed. Aggregated data was used exclusively for academic analysis, meeting data protection standards outlined

3.2 Ontological and Epistemological Position

Guided by a positivist paradigm, this study emphasizes quantifiable and measurable indicators to explore the joint influence of DG and CG on OP. Ontologically, the constructs of governance and performance are treated as objective realities, while epistemologically, the study prioritizes empirical measurement and observation using verifiable metrics. Epistemologically, this research emphasizes the collection of objective measurements of governance variables (such as board composition and data compliance metrics) and performance indicators (such as financial growth and operational efficiency metrics).

3.3 Cross-Sectional Correlational Design

This research employs a cross-sectional correlational design to inspect the relationships between DG, CG, and OP. This methodological approach enables the simultaneous collection of data from multiple organizations, providing comprehensive snapshot in time, of current governance practices and performance outcomes. While this design effectively identifies associations between the variables of interest, there are limits in establishing causal relationships. The cross-sectional approach was selected for two primary reasons. First, it offers a broad perspective on contemporary governance practices across diverse industry sectors. Second, it addresses practical considerations, including resource constraints and data collection feasibility, as a one-time survey administration is significantly more manageable than longitudinal alternatives that would require repeated data collection over extended periods.

3.4 Unique Aspects

- **Collaboration with DAMA:** Taps into a specialized network of DG professionals, across industries, enhancing content validity for DG constructs.

- **Integration of CG:** In addition to DG, the survey captures core CG elements (such as board size, CEO duality, etc.) for a multi-dimensional exploration of how both governance domains jointly relate to OP.

3.5 Research Purpose and Questions

This study is essential in the contemporary digital and data-centric organizational landscapes in organizations. As organizations evolve into data-centric settings with the recent changes, the necessity for robust governance frameworks becomes essential to guarantee responsible data management and strategic utilization with quality insights and decisions. Although the study initially targeted the banking sector, limited access to data necessitated broadening the scope to include other industries. We formulated the following research questions to address the identified gaps. Below are the questions that inform the choice of a correlational, cross-sectional design.

Research Questions Follow:

- Which factors in DG drive performance improvements in organizations, and how can executives and data leaders effectively embed these practices into the organization?
- Does CG moderate the relationship between DG practices and OP, and which governance mechanisms are most influential?
- How does the alignment of CG and DG goals contribute to OP?

Objectives of the Study:

a) To create a thorough conceptual framework for corporate DG that addresses the interaction between CG principles and DG practices within firms in a way that impacts OP

b) To empirically validate the impact of DG on OP in firms and identify if CG influences this relationship

c) To offer CXOs, business professionals, and data managers insightful analysis on best practices and practical advice for businesses looking to maximize their DG projects.

Hypothesis of the Study

- **H1:** The maturity of DG policy and procedures influences the degree of organizational effectiveness.
- **H2:** CG influences the relationship between DG practices and OP.
- **H3:** The OP is positively impacted by the convergence of CG goals with DG goals.

3.6 Research Design

The research is distinguished by its application of a correlational design, with the primary focus on dynamic association between the OP and DG. Investigating how CG affects this relationship is the study's main goal. The research identified how convergence of CG goals with DG methods impacts performance of the business. Quantitative methodologies and data analytic approaches are leveraged, to reveal the problems and opportunities that organizations have when it comes to aligning these governance frameworks, with the ultimate goal of improving their performance in an organizational environment that is highly competitive.

3.7 Research Methodology

The research examines association between DG and OP, and function that CG that plays as a mediator in this relationship. A correlational approach has been utilized to examine the relationships among these variables. Conceptual modelling as well as

detailed literature evaluations are the key research methodologies that are applied to develop theoretical frameworks and formulate hypotheses. This ensures that a solid foundation is established for the investigation. Using this approach makes it easier to uncover the most important relationships and dynamics within the governance structures, which ultimately leads to a more profound comprehension of these structures' impact on the organizations' efficiency.

It also verifies the arbitrating function of CG in this relationship. Conceptual modelling and literature reviews are the primary research methods used to create theoretical frameworks and hypotheses. The variables chosen to assess the study's hypothesis is listed in Table 3.1.

Table 3.1
Data Variables of Study

CATEGORY	VARIABLE
DATA GOVERNANCE (DG) (Abraham, Schneider and Vom Brocke, 2019; Acosta-Mérida, 2023; Al-Badi et al., 2018; Alhuwail, 2021; Black et al., 2023; Chen et al., 2024; Inmon and Linstedt, 2015)	Data Quality
	Data Ownership
	Data Privacy
	Data Governance Policy
	Data Compliance
	Data Management and Integration
CORPORATE GOVERNANCE (CG) (He et al., 2024; Hunjra et al., 2024; Hussain and Loureiro, 2022; Lee et al., 2023; Palea et al., 2024; Wang and Yang, 2023; Wu et al., 2023)	Board Independence
	Board Size
	CEO-Chairman Duality
	Executive Compensation Structure
	Shareholder Rights
	Transparency and Disclosure
	Audit Committee Effectiveness
	Risk Management Policies
	Regulatory Compliance
	Board Diversity
ORGANIZATIONAL PERFORMANCE (Ahmed et al., 2024; Algarni et al., 2022; Badunenko & Kumbhakar, 2017; Bebchuk Et al., 2004; Dalton et al., 1998; Fornell et al., 1996; Harter et al., 2002; Healy & Palepu, 2001; Kim et al., 2023;	Financial Performance
	Operational Efficiency
	Customer Satisfaction
	Employee Engagement
	Innovation and R&D
	Market Share
	Reputation and Brand Value
	Environmental Performance

Markovich et al., 2022; Miles E.A. Everson et al., 2017; Robles-Elorza et Al., 2023; Siddik et Al., 2023; Tzeremes, 2015; Xia et Al., 2021; Zhang et Al., 2013)	Social Responsibility Risk Incidents

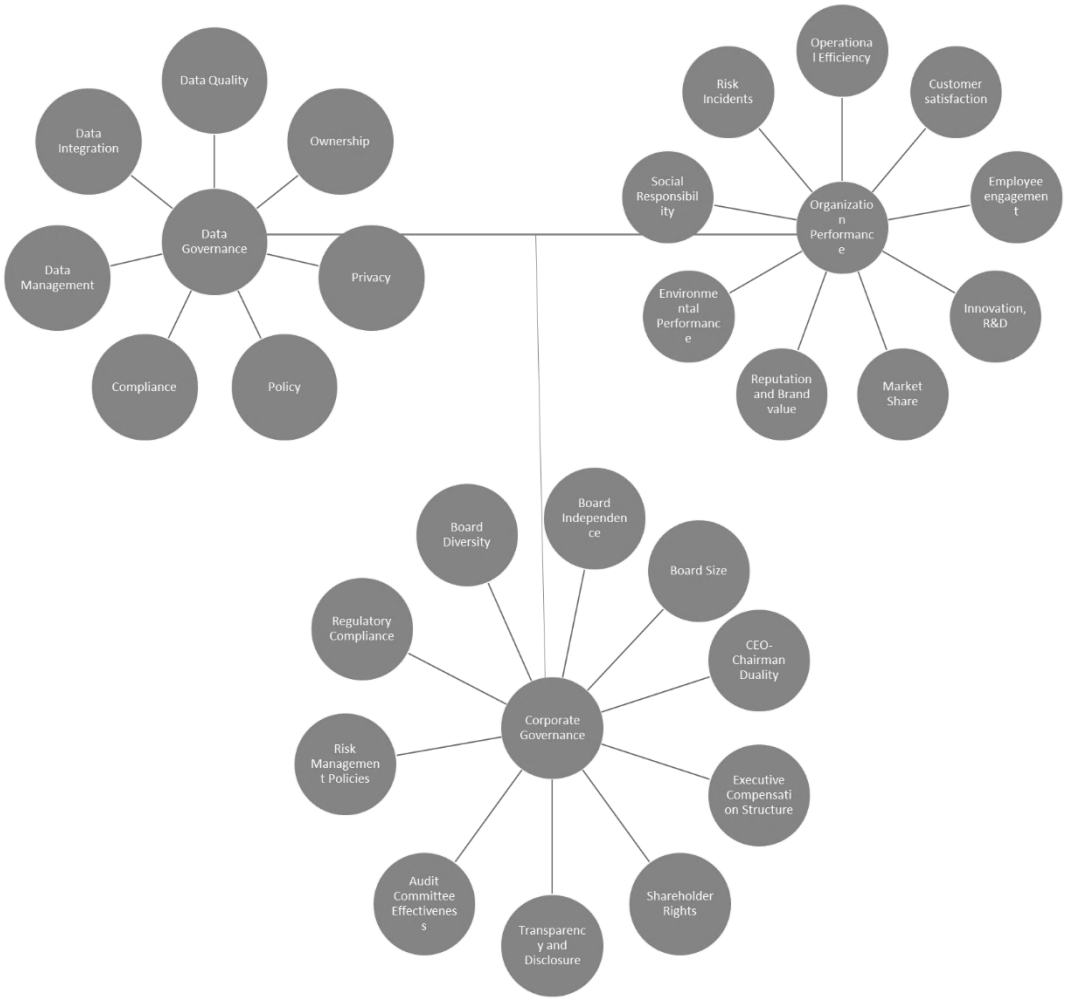


Figure 3.3
Conceptual model for DG, CG, and OP.

3.8 Population and Sample

A sample of 400 middle- and senior-level managers working for different companies across India was chosen for the study. To ensure diverse representation across different geographies and governance levels, the sample uses stratified random sampling.

The sample is suitable for analyzing the intricate linkages among DG, CG, and OP in organizations, offering dependable and thorough insights into the study's objectives.

Sampling Design

A stratified sample design was employed to examine DG, CG, and OP relationships in organizations to guarantee representative and thorough data collection. Stratified sampling entails segmenting the population of global organizations into discrete sub-groups or strata according to features, including geographical location, organizational size, and the degree of implementation. Data is gathered from a variety of organizations, assuring the inclusion of experiences and viewpoints from both middle and senior-level personnel. The study seeks to enhance the accuracy of governance practice representation by stratifying the sample across various regions and organizational structures, thereby improving the reliability of results related to influence of data and CG on OP.

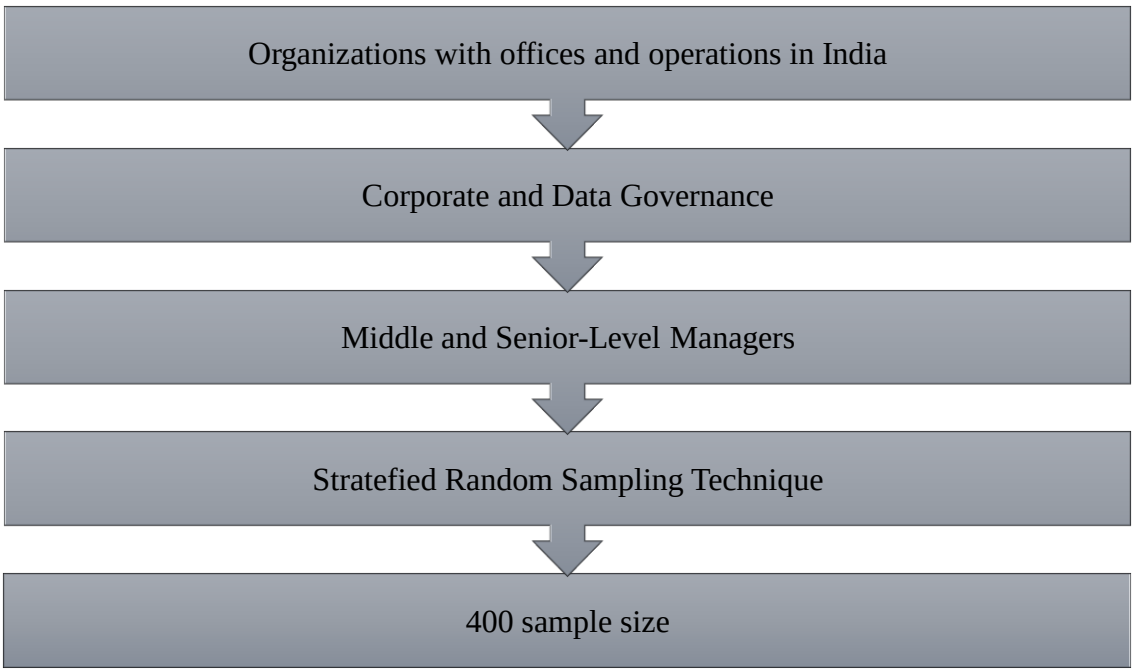


Figure 3.4
Sampling Design

3.9 Participant Selection

The research area includes various organizations globally who have Indian presence. It examines implementation of governance methods within India's varied organizations, highlighting the legislative, technological, and market constraints. The study provides significant insights into aligning governance frameworks to advance decision-making, compliance, risk management, and operational efficiency, addressing the increasing requirements of Indian organizations.

3.10 Instrumentation

In this study, statistical tools are employed in several aspects of conducting a study, such as the planning, design, collection, analysis, and reporting of research findings. The study involves thorough statistical analysis using professional commercial statistical tools such as SPSS and Excel.

- **SPSS:** a tool called the Statistical Package for the Social Sciences (SPSS), sometimes referred to as IBM SPSS Statistics, is used. When it was first applied in the social sciences, SPSS expanded its application to include several other areas of data analysis, as seen by its name. The SPSS program was utilized as a fundamental tool for running a diverse range of tests.
- **Excel:** Microsoft Excel is a popular tool that is frequently used in validating manual calculations and improve understanding of statistical principles for solving real-world problems.
- **Python:** An open-source language that initially served as a general-purpose scripting tool but has since expanded its application to areas such as data analytics and machine learning. By leveraging libraries like NumPy, pandas, and scikit-

learn, Python supports efficient data manipulation, statistical analysis, and advanced modeling. In this research, Python was employed to handle large datasets, perform comprehensive statistical tests, and validate findings from other software tools.

3.11 Data Collection Procedures

Data collection is a methodical procedure for obtaining precise information from participants to examine trends, linkages, and possible solutions to research inquiries, facilitating the assessment of organizational dynamics. The research employed data acquired through quantitative approaches. Quantitative information on CG frameworks, OP metrics, and DG procedures was gathered using questionnaires.

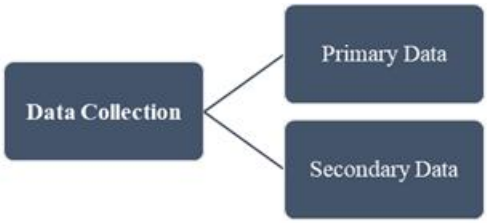


Figure 3.5: Types of data collection

Primary Data

The author directly gathers this data for a particular reason. Primary data refers to information obtained by direct observation or experimentation. Primary data is obtained using questionnaires and surveys. The collection of primary data involves utilizing a self-designed questionnaire with the participants. This study includes the questionnaire survey form for data collection. The questionnaire consists of 2 sections:

- **Section 1: Demographic Profile:** Section 1 of the questionnaire, titled Demographic Profile, gathers essential information regarding the personal attributes and features of the research participants. Questions regarding

demographic variables like age, gender, years of experience, present role and department, as well as any other pertinent information related to the research domain.

- **Section 2: Based on Variable:** This section utilizes 5-point Likert scale understanding viewpoints of employees and managers in organizations throughout India. This section contains statements about the fundamental components of the study:
  - DG Practices (e.g., policy levels, compliance metrics)
  - CG Practices (e.g., CEO–chairman duality, board size, transparency)
  - OP (e.g., financial metrics, operational efficiency, risk incidents)

3.12 Data Analysis

Quantitative methods, including statistical analysis, computational modeling, and numerical techniques, are used. Statistical techniques were utilized to extract insights from data and perform various reliability evaluations on their findings. Various statistical methodologies were accessible for assessment; nonetheless, following the objectives and hypotheses, the selected statistical techniques comprise regression analysis and correlation analysis.

Regression

A regression model is used to show how changes in independent variables relate to variations in the dependent variable. Deployed to examine how changes in independent variables (such as DG maturity) affect dependent variables (such as OP).

$$Y = a + bX + u$$

Correlation

Correlation is a statistical measure that captures how closely two variables vary in relation to one another. Two variables have a positive correlation when they move in the

same direction. It only applies in this particular situation. The tendency of two variables to move in opposite directions is known as a negative correlation.

$$"r = \frac{\sum(xi - \bar{x})(yi - \bar{y})}{\sqrt{\sum(xi - \bar{x})\,2 \sum(yi - \bar{y})\,2}}"$$

In this analysis, Pearson correlation analysis is used through SPSS software.

Descriptive Statistics

For summarizing central tendencies, dispersion, and distribution of responses to improve foundational understanding of the dataset.

Reliability Analysis (e.g., Cronbach's Alpha):

To measure the core consistency of the concepts used in the survey.

Bivariate Pearson Correlation Analysis:

To examine the strength and direction of the relationships between DG practices, CG, and OP, a Bivariate Pearson Correlation Analysis was conducted. This technique was employed to identify whether statistically significant linear associations exist between the variables, providing insights into how closely DG and CG relate to OP.

ANOVA (Analysis of Variance):

Differences in mean values were assessed across diverse groupings, including governance maturity tiers and industry classifications.

Multivariate Regression or Structural Equation Modeling (SEM):

This technique is considered for capturing interdependencies and causal pathways among multiple governance and performance variables simultaneously.

3.13 Conclusion

In conclusion, the aim is to examine complex interrelationship between both governance domains and performance in organizations. The study established the foundation for an extensive examination of the major elements influencing OP in

organizations. It further validates the importance of governing data while also exploring potential approaches to improve DG practices. The study also empirically identifies if CG moderates linkages in governing data and company performance.

CHAPTER IV:

RESULTS

4.1 Reliability Analysis

Table 4.1
Reliability Statistics

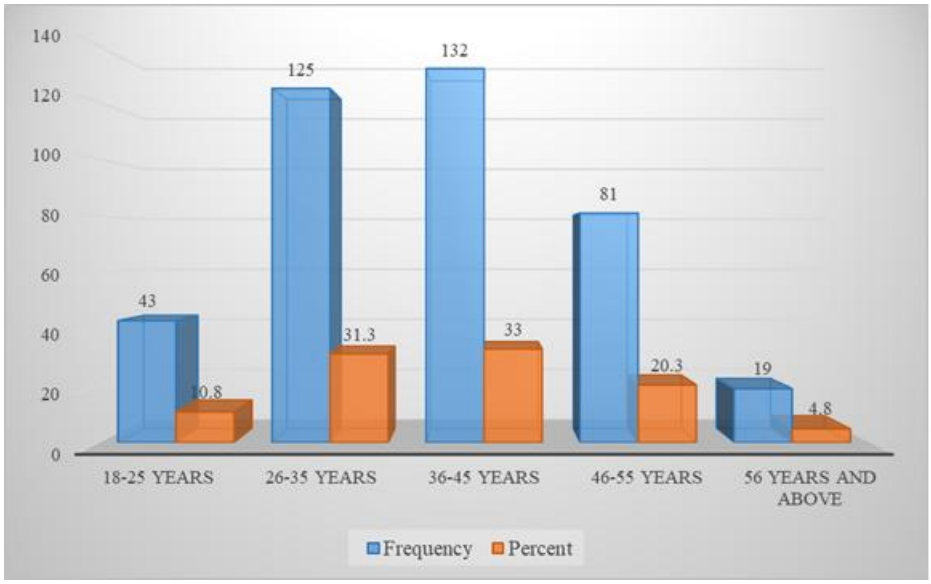
Cronbach's Alpha	# Items
0.717	27

Table 4.1 shows that the 27-item scale accepts internal consistency because it demonstrates a Cronbach's Alpha of 0.717. The social science field considers reliability statistics above 0.7 to be acceptable yet the measured value of 0.717 is classified as displaying moderate reliability performance.

4.2 Frequency Analysis

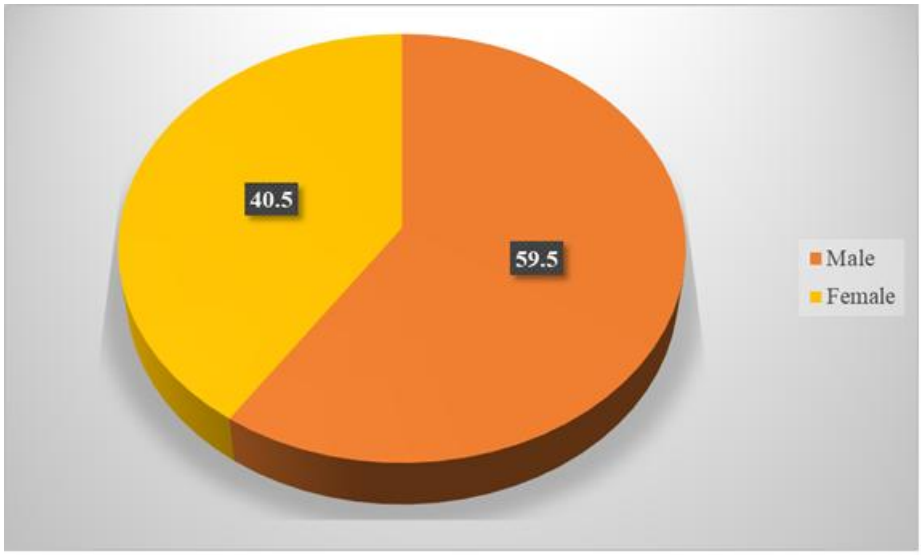
Demographic Details of Respondents

Figure 4.1
Age



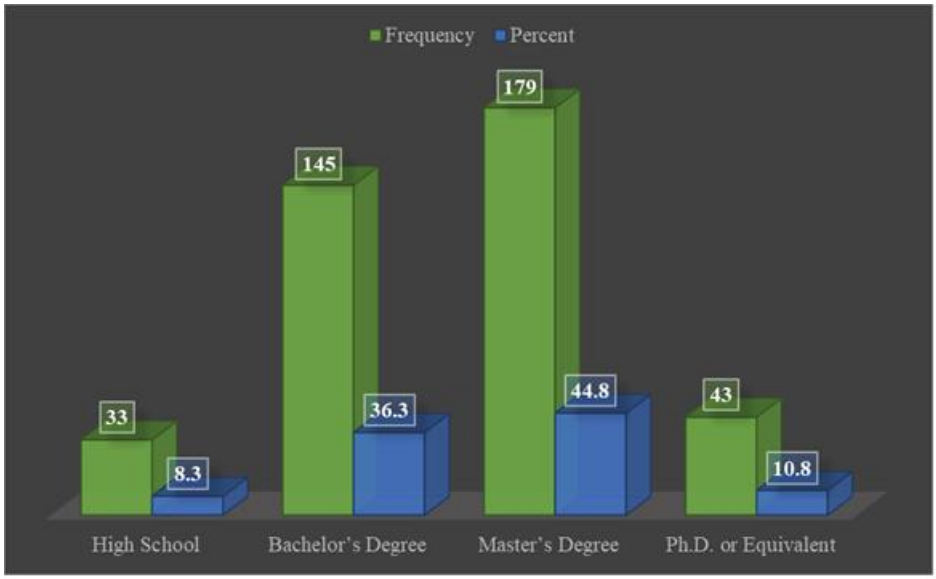
As shown in Figure 4.1, most respondents, i.e., 64.3%, fall within the 26–45 year range, while the group 36–45 years alone constitutes the largest segment of 33%. Just 4.8% of the total people aged 56 and up are the most under-represented age group. This shows an insight that mid-career professionals are actively engaged in DG, strategic decision-making, or corporate structure roles.

Figure 4.2
Gender



From the data presented in Figure 4.2, we can deduce that men make up 59.5% of the total and females just 40.5%. There were more men than women taking part in the survey.

Figure 4.3
Education



According to Figure 4.3, the respondents' educational backgrounds are as follows: 44.8% have a Master's degree, 36.3% have a Bachelor's degree, 10.8% have a Ph.D. or equivalent, and 8.3% have only completed high school.

Figure 4.4
Years of experience

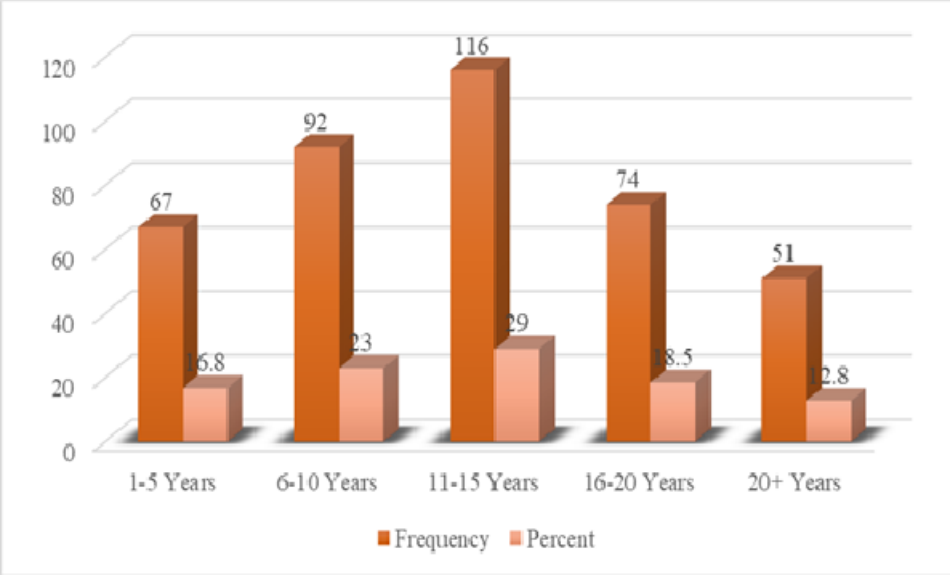
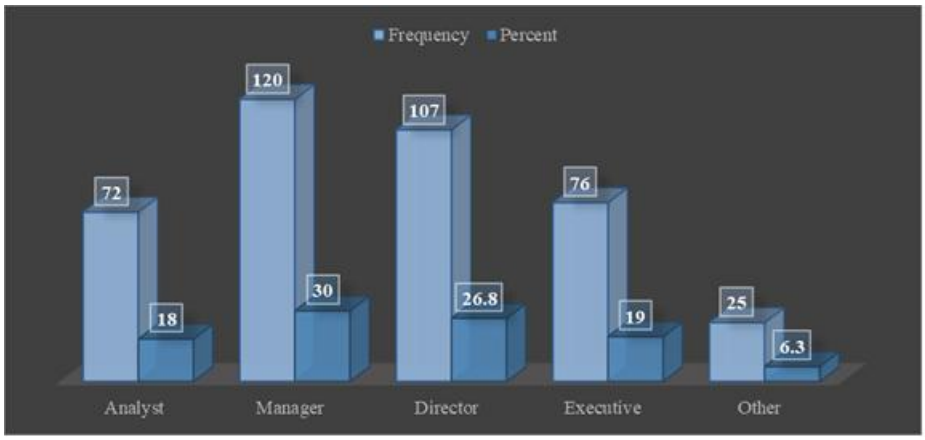


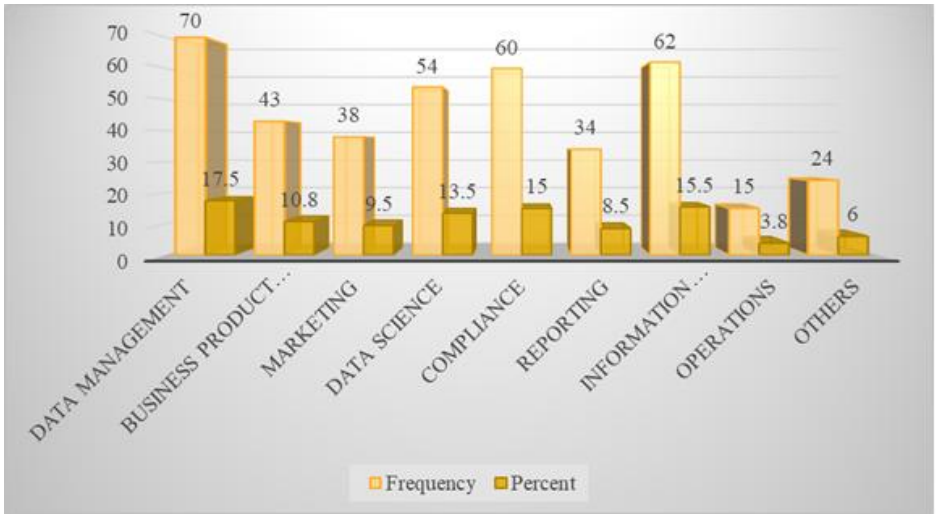
Figure 4.4 illustrates that the most survey takers are having greater than 6 years of professional practice, with 29% of the respondents falling in the 11-15 years range. It can be implied that mid-senior level professionals are involved in decision-making in organizations. The dominance of experienced professionals provides an insight that data curated is grounded in practical exposure from organizations and personnel within decision structures. This in turn validates the upcoming findings that DG influences OP, and the relationship between DG and DG enhances influence by the experience-led insights (83.2%) who would have led governance transformations in organizations.

Figure 4.5
Current Position



The above Figure 4.5 represents a variety of organizational positions, with managers and directors accounting for over half, i.e., 56.8% of the sample. This indicates that much of the data comes from individuals engaged in day-to-day management, governance, and supervisory roles within their institutions. Executives, contributing 19% of respondents, who may be holding strategic responsibilities, contribute viewpoints that provide direction. Analysts contributing 18% of respondents may bring valuable operational input, offering a bottom-up perspective on how governance is applied in practical and operational contexts.

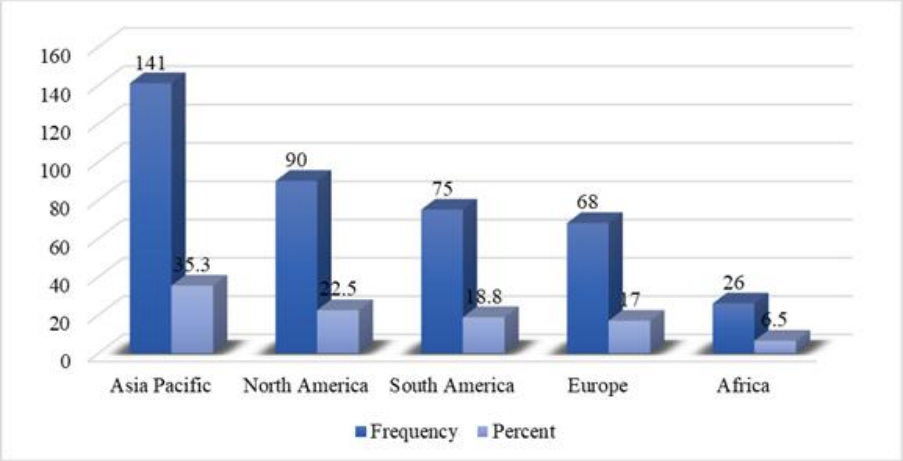
Figure 4.6
Department



The distribution of respondents across departments shows representation from data-centric and governance-relevant functions, with data Management (17.5%), IT (15.5%), and Compliance (15%) forming the top three. This indicates that the study draws insights from professionals engaging in data handling, regulatory preparedness, and system integration. Other significant contributors include-

- Data Science at 13.5%, reflecting insight generation roles that interact with governance through data quality and insight generation.
- Business Product Management at 10.8% and Marketing at 9.5%, suggesting involvement from functions that associate with data products for customer management.
- Reporting is at 8.5%, a critical operational function where DG impacts accuracy and accountability in operational and regulatory reporting.

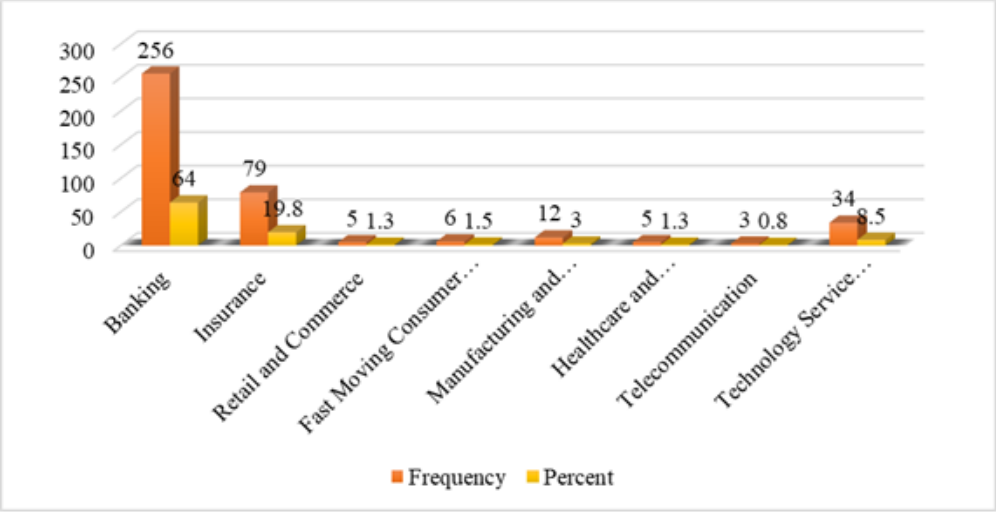
Figure 4.7
Please indicate your organization's headquarters.



The distribution of organizational headquarters as shown in above Figure 4.7, with the majority based in the Asia Pacific region 35.3%, followed by North America 22.5% and South America 18.8%. Europe accounts for 17.0%, while Africa has the smallest representation at 6.5%.

Industry

Figure 4.8
Please indicate the industry you work in?

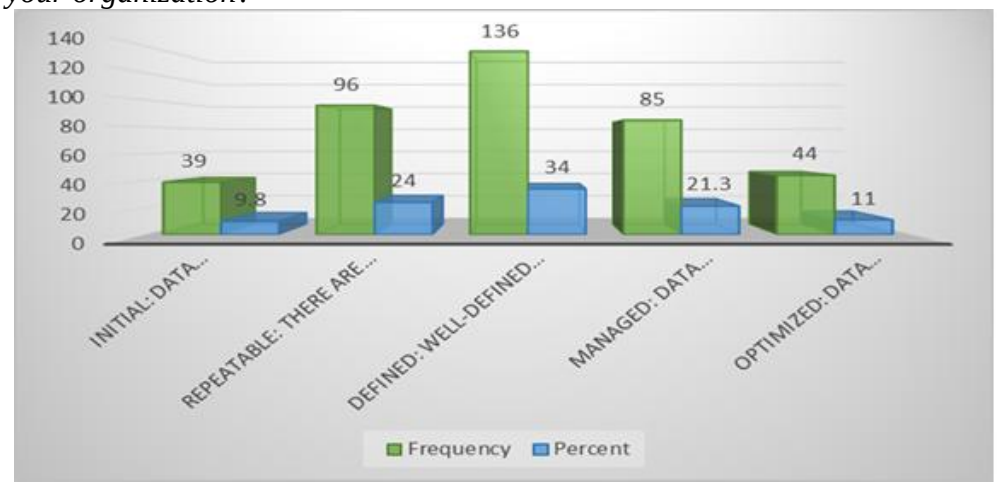


The above Figure 4.8 illustrates the industry distribution of respondents, showing that the majority work in the banking sector 64.0%, followed by insurance 19.8% and technology service providers 8.5%. Other industries, including manufacturing and industrial sectors 3.0%, retail and commerce 1.3%, fast-moving consumer goods 1.5%, healthcare and pharmaceuticals 1.3%, and telecommunication 0.8%, have relatively lower representation. The sectoral representation of respondents reveals a heavy concentration in the financial sector, with Banking alone accounting for 64% and Insurance accounting for an additional 19.8%. This dominant representation (83.8% combined) suggests that the findings are highly reflective of practices of governing data within regulated environments.

Data Governance Survey Section

Data Quality

Figure 4.9
In your objective assessment, how would you describe the current state of data quality within your organization?



The above Table 4.10 shows that the assessments of data quality within their organizations. The majority 34.0% indicate that their organizations have well-defined processes and training programs for data management, while 24.0% report having some informal data management practices. A lesser amount Data management is fully

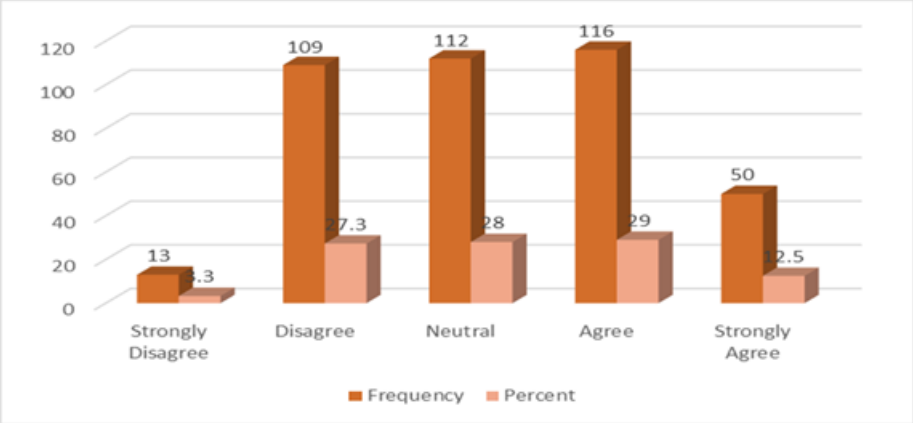
incorporated into their organization's strategy, according to 11.0 percent of respondents, and 21.3% say it is in line with organizational goals. Nevertheless, 9.8% of respondents say that data management is still done on an as-needed basis.

This distribution reflects a progressive yet uneven maturity landscape, with most firms situated in the middle layers of maturity. This provides a valuable insight that there is an ongoing shift from reactive to proactive DG, and the opportunity to align with organizational goals.

Data Ownership

Figure 4.10

The roles of data owners are clearly defined within my organization.



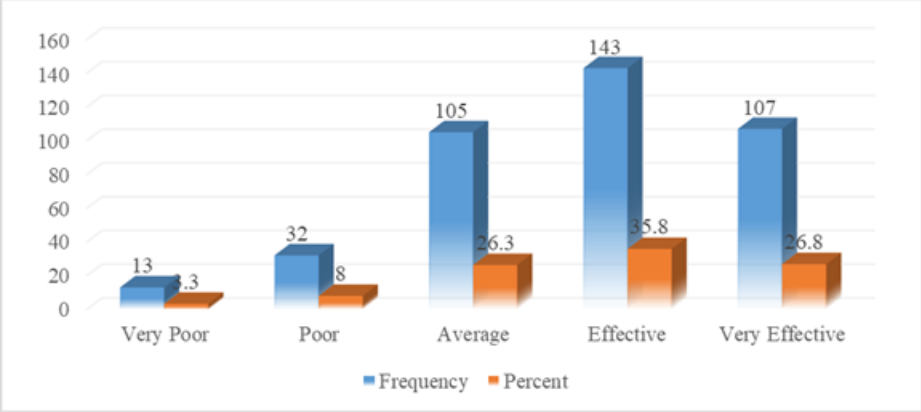
The clarity of data owner roles within their organizations is as shown in above Table 4.11. The findings indicate a mixed insight regarding the clarity on data ownership within organizations. While 41.5% of respondents (29% agree and 12.5% strongly agree) believe these roles are clearly defined, this is offset by 30.6% (27.3% disagree and 3.3% strongly disagree) who express dissatisfaction or lack of clarity in this area.

Remarkably, 28% of respondents remain neutral, suggesting ambiguity in their exposure to their understanding of data ownership structures. This sizeable neutral segment may reflect inconsistencies in how such roles are supposed to be defined and implemented across different departments. Overall, the results underscore a need for greater

standardization and communication around data ownership responsibilities, particularly as clarity in this area is fundamental to effective governance, accountability, and stewardship practices.

Data Management

Figure 4.11
How effective are the processes for database management in your organization?

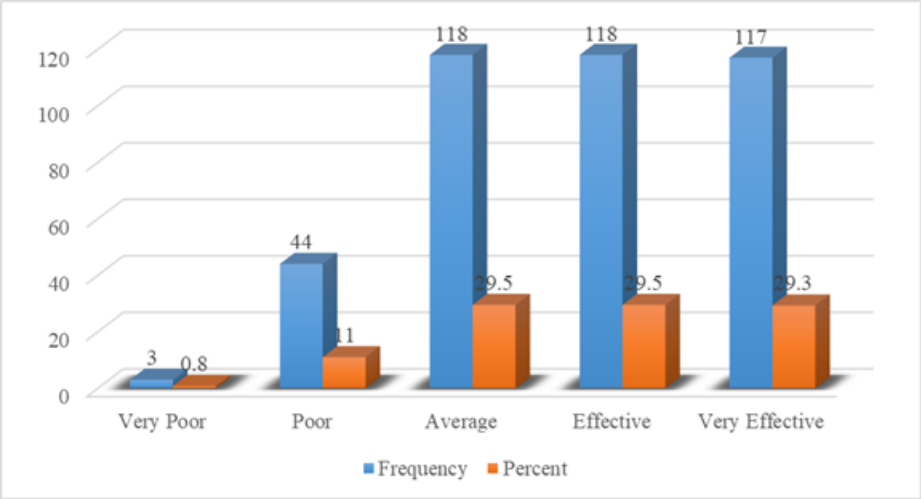


The above Figure 4.11 shows the effectiveness in database management processes within the respondents' organizations. A combined 62.6% of participants (35.8% effective and 26.8% very effective) expressed confidence in the robustness of the database management processes, indicating a generally positive perception of how databases are managed. Meanwhile, 26.3% rated the processes as average, suggesting that a prominent segment of respondents think there is room for improvement. A smaller share of respondents, that is around 11.3% in total (8.0% poor and 3.3% very poor) indicated dissatisfaction, pointing to possible gaps in infrastructure, database management practices, or governance oversight in certain organizations. This spread of responses shows an overall moderate to high level of database management maturity while also highlighting opportunities for organizations to enhance database management processes, consistency, and outcomes.

Data Integration

Figure 4.12

How effective are the processes for data integration in your organization?

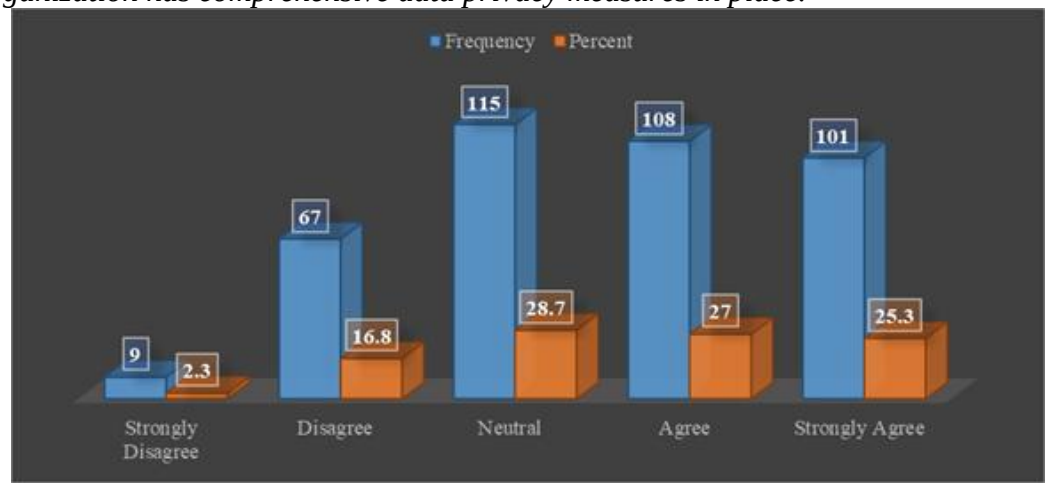


The effectiveness of data integration processes within their organizations as shown in Table 4.13 above. A significant segment of participants rated these processes positively, with 29.5% describing them as effective and 29.3% as very effective. This indicates that nearly 59% noted high efficiency in how data integration is managed. An equal segment 29.5% rated the processes as average, suggesting that while integration mechanisms are in place, they may lack consistency in certain contexts. On the other end of the range, 11% of respondents viewed the integration processes as poor, while only 0.8% rated them as very poor. This limited dissatisfaction highlights isolated gaps in execution but does not overshadow the overall positive sentiment.

Data Privacy

Figure 4.13

Our organization has comprehensive data privacy measures in place.



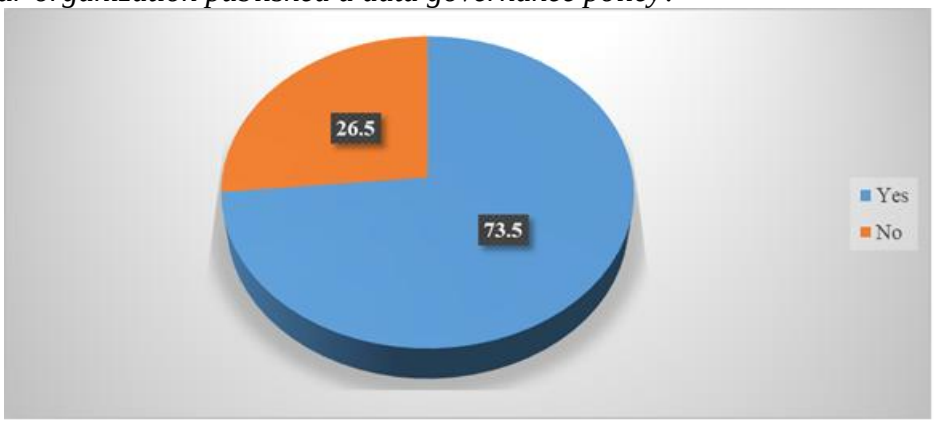
The above Figure 4.13 shows respondents' perceptions of their organization's data privacy measures. A combined 52.3% of participants (27.0% agree and 25.3% strongly agree) affirmed that robust privacy practices are in place, suggesting a generally positive outlook toward privacy governance.

However, a considerable portion (28.7%) selected a neutral response, indicating either limited awareness of implemented privacy. Additionally, 19.1% of respondents expressed disagreement (16.8% disagree and 2.3% strongly disagree), revealing that a segment of organizations may lack the minimum required privacy controls or formalized policies related to data privacy.

Overall, while the results reflect a strong foundation in privacy governance across many organizations, the notable proportion of neutral and negative responses signals a need for greater employee awareness, and formalization of data privacy practices.

Data Governance Policy

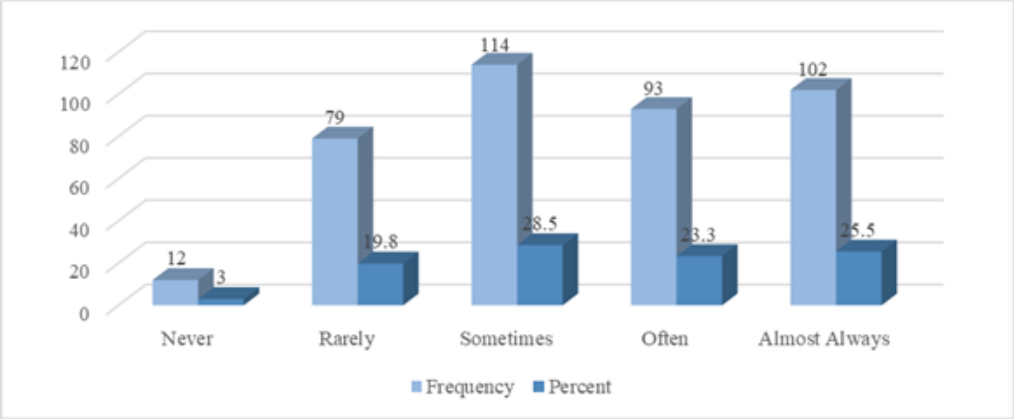
Figure 4.14
Has your organization published a data governance policy?



The above Figure 4.15 shows that A substantial majority of respondents 73.5%—confirmed that their organization has published such a policy, suggesting that DG is formally recognized and documented in most cases. Conversely, 26.5% of respondents indicated the absence of a published policy, highlighting a notable gap in foundational governance documentation for over a quarter of the organizations surveyed. The presence of a formal policy serves as a critical baseline for standardizing roles, responsibilities, and procedures. As such, the findings suggest that while many organizations are on the path to formalized governance, some can used improved policy.

Data Governance Policy

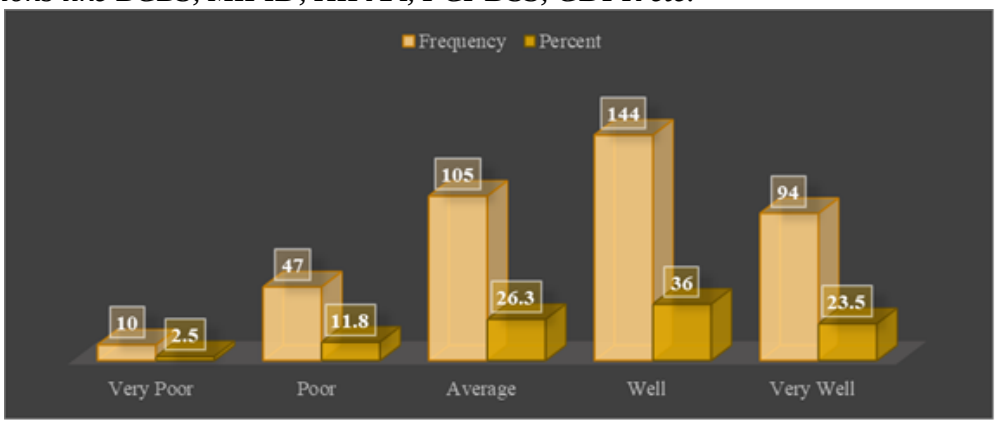
Figure 4.15
Please indicate whether employees adhere to the established data governance policy in their daily routines.



The employee adherence to their organization's DG policy in daily routines as shown in above figure 4.15. A combined 48.8% of participants reported that employees follow these policies often (23.3%) or almost always (25.5%), indicating a moderate to strong level of policy integration into daily activities. However, 28.5% of respondents stated that adherence occurs only sometimes, and an additional 22.8% (19.8% rarely and 3.0% never) observed limited or negligible compliance. This distribution highlights a degree of inconsistency in policy enforcement and suggests that in some organizations, governance principles may not yet be fully embedded in operations. The findings also stress enhanced awareness and accountability to ensure that DG policies are not only published but also actively observed and internalized by employees across functional levels.

Data Compliance

Figure 4.16
Please evaluate the extent to which your organization adheres to data-related laws and regulations like BCBS, MIFID, HIPAA, PCI-DSS, GDPR etc.



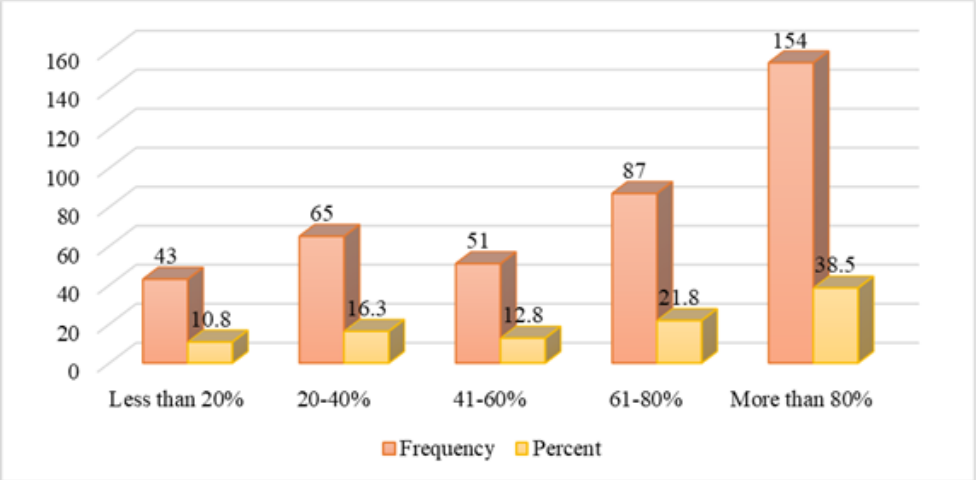
The evaluations of their organization's compliance to laws and regulations, such as BCBS, MIFID, HIPAA, PCI-DSS, and GDPR, are shown in Table 4.17 above. A majority of participants (59.5%) state that their organizations' compliance is certainly, with 36.0% indicating Well and 23.5% stating Very Well. This reflects a strong regulatory focus among most organizations and suggests that compliance with legal and industry standards is being actively managed. This is probably because most respondents are from banks. Nonetheless, 26.3% of respondents rated compliance as Average, pointing to potential gaps in the enforcement of regulatory requirements associated with data. In contrast, 14.3% of participants (11.8% poor and 2.5% very poor) perceived their organization’s compliance as inadequate that highlights probably industries that are not required to adhere to regulations. These findings suggest that while many organizations demonstrate mature regulatory alignment, a significant portion may still be evolving their

compliance frameworks, calling for investments in compliance-based data management policy and integration to meet evolving regulations.

CG Section

Board Independence

Figure 4.17
Proportion of independent, non-executive directors on the board



Data from Figure 4.17 shows that 38.5% of organizations have boards comprising independent directors, more than 80%, indicating a strong alignment with CG practices that promote board autonomy and oversight. An additional 21.8% state that 61–80% of their board comprises independent members, further reflecting a commitment to balanced decision-making.

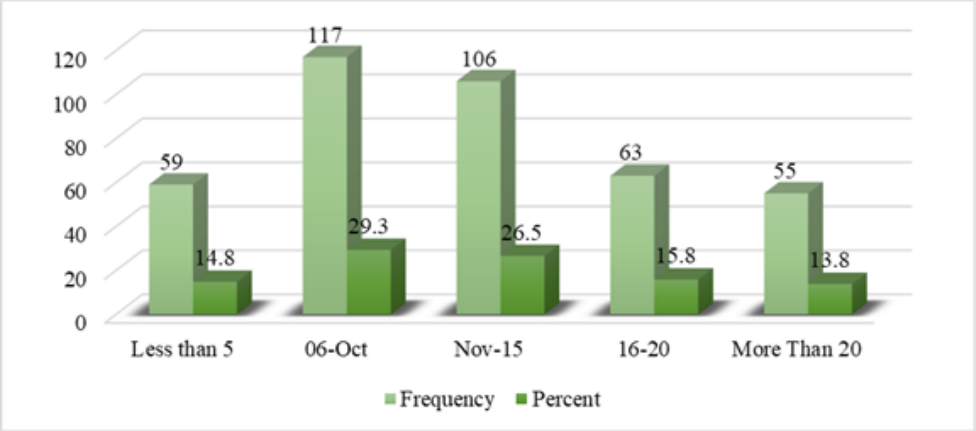
Conversely, 16.3% of respondents state that 20–40% of their board consists of independent directors, while 12.8% reported representation in the 41–60% range. A smaller segment, 10.8, indicated that independent directors constitute less than 20% of the board, which may raise concerns regarding board independence and its ability to provide oversight and direction.

Overall, the data suggests that a majority of organizations maintain a high degree of board independence, a factor often associated with stronger accountability, transparency, and governance effectiveness.

Board Size

Figure 4.18

Please specify the number of members on your organization's board of directors.

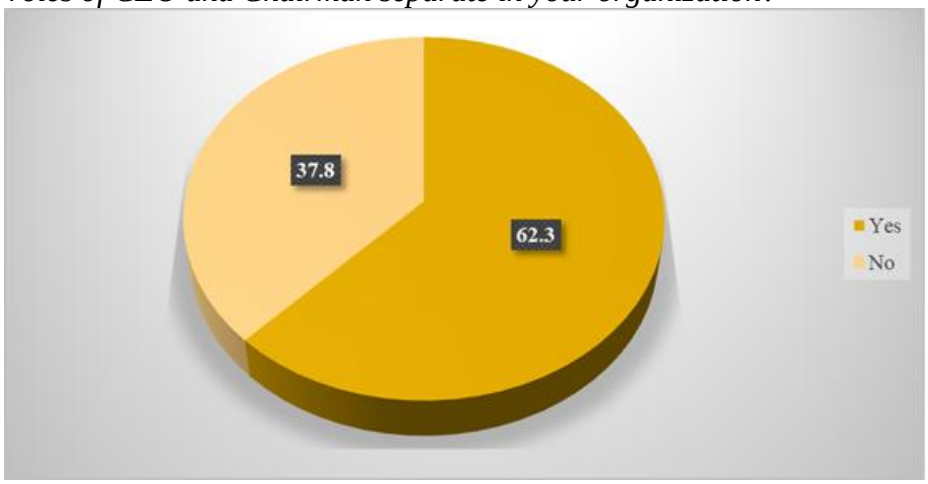


Distribution of board sizes across organizations is shown in Figure 4.18 above. The most frequently reported board size falls within the 6–10 member range (29.3%), followed closely by boards consisting of 11–15 members (26.5%). Together, these two categories represent over half of the sample, indicating a preference for moderately sized boards, which are often considered optimal for balanced decision-making and strategic oversight. A smaller proportion of organizations have 16-20 members 15.8% or more than 20 members 13.8%, while 14.8% have boards with fewer than 5 members.

The data suggests that while most organizations favor medium-sized boards, a degree of variation exists that is influenced by contingency factors like organizational size, industry sectors, and regulatory requirements.

CEO Chairman Duality

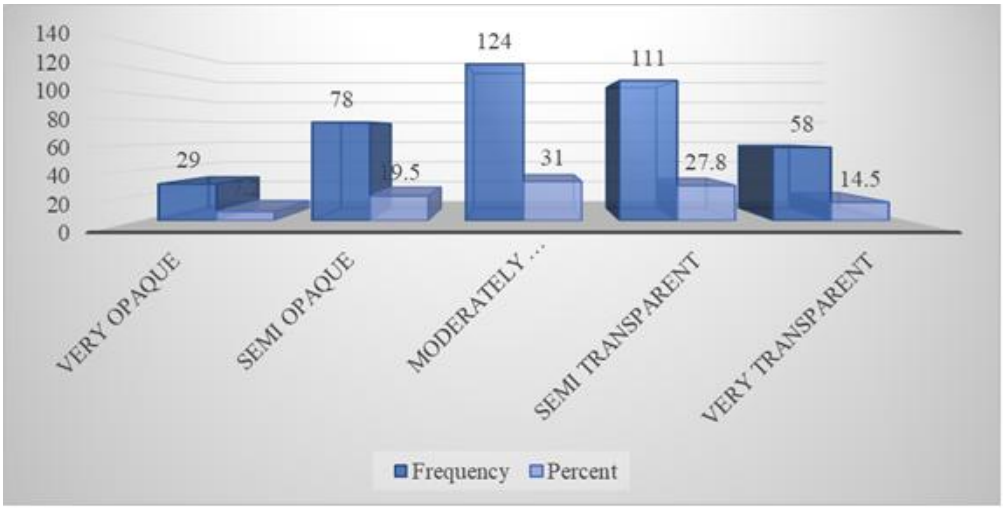
Figure 4.19
Are the roles of CEO and Chairman separate in your organization?



In above Figure 4.19 shows whether organizations separate roles of CEO and Chairman. A majority 62.3%, have distinct individuals holding these positions, while 37.8% combine them.

Transparency and Disclosure

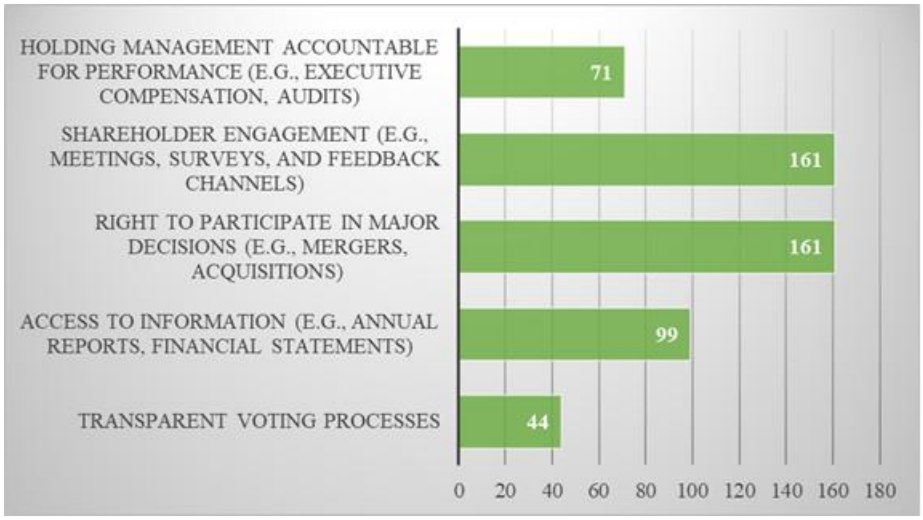
Figure 4.20
Please assess the level of openness of the executive pay structure in your organization.



The above Figure 4.20 shows assessments of transparency of executive pay structure within their organizations. The majority indicate that the pay structure is either moderately transparent (31.0%) or semi-transparent (27.8%), suggesting that while some level of openness exists. Meanwhile, 19.5% perceive the structure as semi-opaque, and 7.2% consider it very Opaque, highlighting concerns about restricted visibility in executive compensation. Only 14.5% describe the pay structure as very transparent, indicating that few organizations provide complete clarity on executive remuneration. These findings present that there is a partial implementation of standards on transparency with executive remuneration that has implications on broader governance practices such as stakeholder trust, and alignment with corporate values.

Shareholder Rights

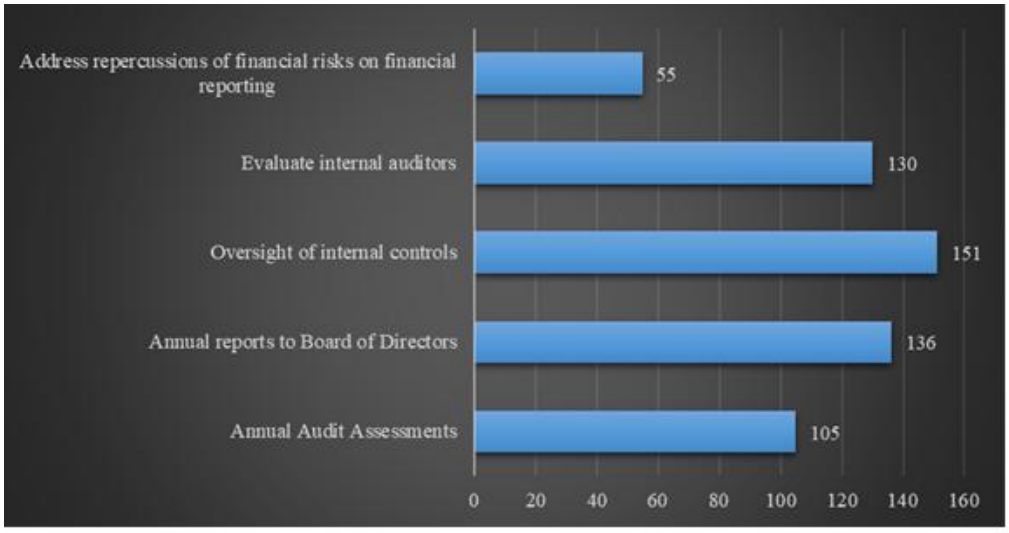
Figure 4.21
Please select the measures in place to safeguard shareholder rights in your organization.



The data in Figure 4.21 shows the measures to safeguard shareholder rights within the organization. Among the listed safeguards, the most widely implemented are rights to contribute to major decisions (e.g., mergers and acquisitions) and shareholder engagement mechanisms (e.g., meetings, surveys, and feedback channels), both reported by 161 respondents. Access to information, such as annual reports and financial statements, is also a significant measure, with 99 respondents acknowledging its availability. Holding management accountable for performance through mechanisms like executive compensation and audits is recognized by 71 respondents. On the contrary, transparent voting processes appear to be the least emphasized safeguard, with only 44 respondents indicating its presence. Collectively, the findings reflect an emphasis on engagement and participatory rights of shareholders, while also highlighting areas for improvement in transparent voting frameworks.

Audit Committee Effectiveness

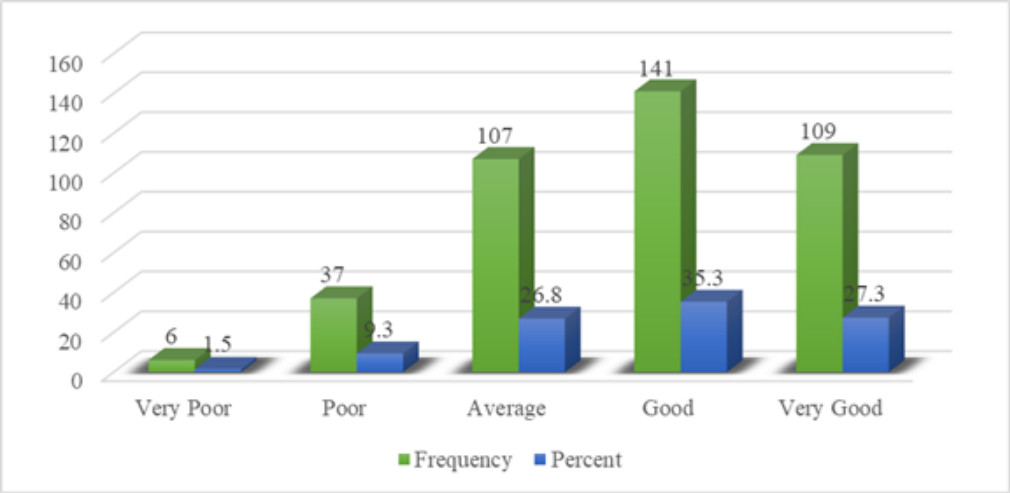
Figure 4.22
Please indicate which of the following aspects your audit committee follows in your organization



The figure indicates the key aspects taken by the audit committee within organizations. Oversight of internal controls is the most frequently reported function, with 151 respondents indicating its presence, highlighting its critical role in maintaining financial integrity. Annual reports to Board of Directors (136 respondents) as well as evaluation of internal auditors (130 respondents) are also widely practiced, ensuring transparency and accountability. Annual audit assessments, acknowledged by 105 respondents, further reinforce the organization's commitment to financial oversight. However, addressing the repercussions of financial risks on financial reporting appears to be the least prioritized aspect, with only 55 respondents recognizing its implementation. These results point to a prevalence of stronger routine in audit governance, while also revealing opportunities to strengthen strategic risk responsiveness within the audit function associated with financial risk.

Financial and Non-Financial Reporting

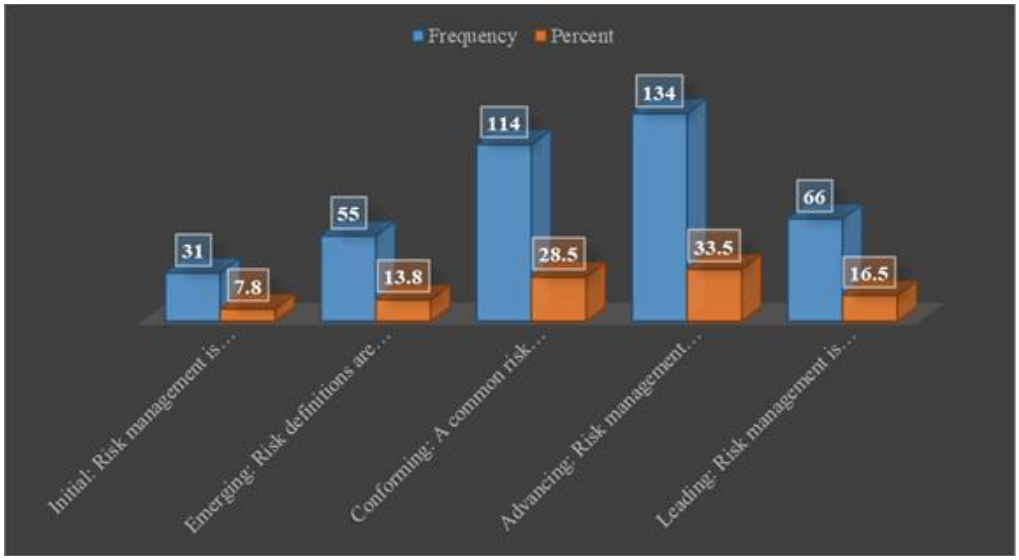
Figure 4.23
How would you rate the quality of your organization's financial and non-financial reporting?



Majority of respondents rate quality of financial and non financial reporting positively, with 35.3% considering it good and 27.3% rating it as very good, indicating that most organizations maintain a strong standard of reporting. However, 26.8% perceive the quality as average, suggesting room for improvement. A smaller proportion finds the reporting inadequate, with 9.3% rating it as Poor and 1.5% as very Poor. These results reflect a positive perception on reporting standards, with opportunities for continued improvement in consistency of reporting.

Risk Management Policy

Figure 4.24
Please indicate which of the following statements best indicates the risk management in your organization.



The maturity of risk management practices within organizations is shown in Figure 4.24 above. The largest proportion of respondents (33.5%) classify their organizations as advancing, indicating that risk management activities are well-coordinated across business areas. Additionally, 28.5% place their organizations in the conforming category, suggesting the presence of a standardized risk assessment and response framework. However, a notable 13.8% report that risk definitions remain inconsistent emerging, while 7.8% indicate that risk management is largely ad hoc and reliant on individual efforts "Initial". Only 16.5% categorize their organizations as leading, where risk management is fully optimized and integrated into decision-making. To complete, the results indicate a steady progression in approaching risk management, with many organizations transitioning towards more systematic and cross-functional integration between business units. Yet, the limited depiction at the highest maturity segment suggests that integrating risk oversight into core decision domains remains an area for continued development.

Board Diversity

Table 4.25

How diverse is your board in terms of gender, ethnicity, and professional background?

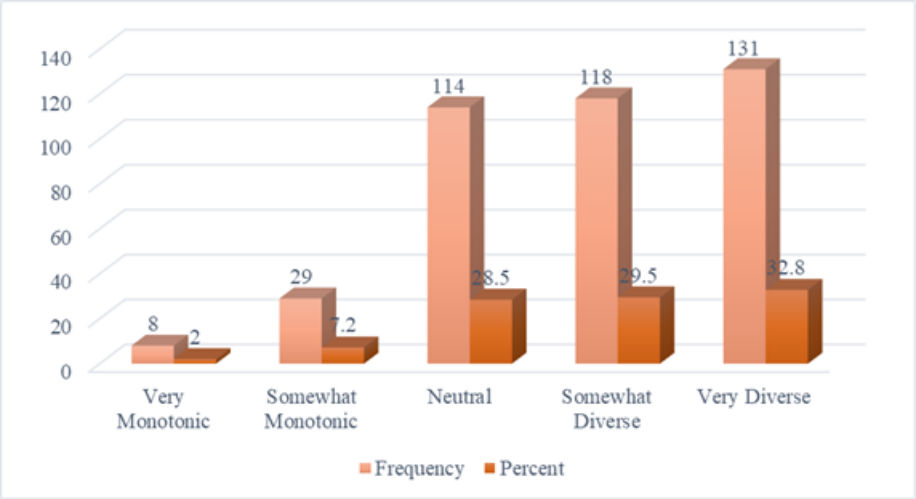
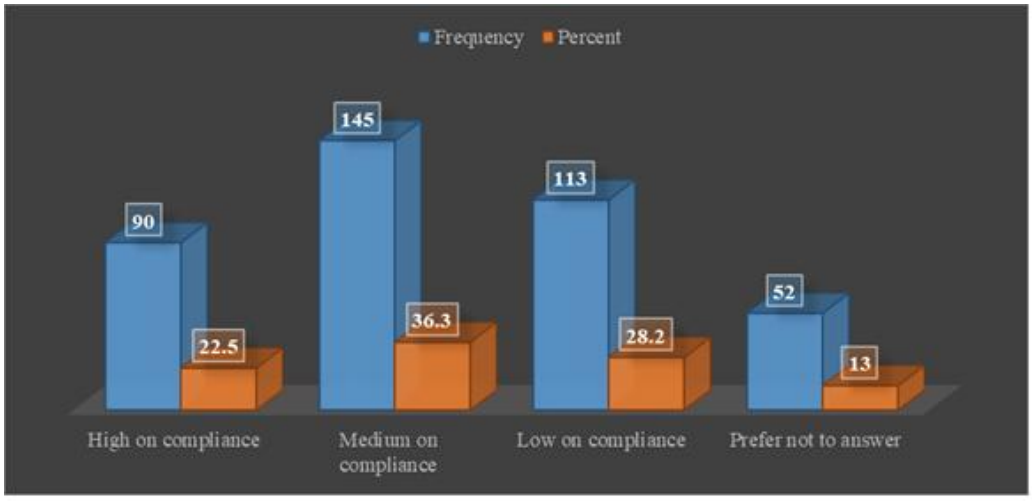


Figure 4.25 above examines board diversity across gender, ethnicity, and professional background. The majority of respondents perceive their boards as diverse, with 32.8% rating them as very diverse and 29.5% as somewhat diverse, indicating significant representation across different demographics and professional experiences. Meanwhile, 28.5% remain neutral, suggesting either limited awareness or mixed perceptions regarding board diversity. On the other hand, a smaller portion views their boards as lacking diversity, with 7.2% rating them as somewhat monotonic and 2.0% as very monotonic.

Regulatory Compliance

Figure 4.26
Which of the options below suits your organization's compliance posture with regulations?

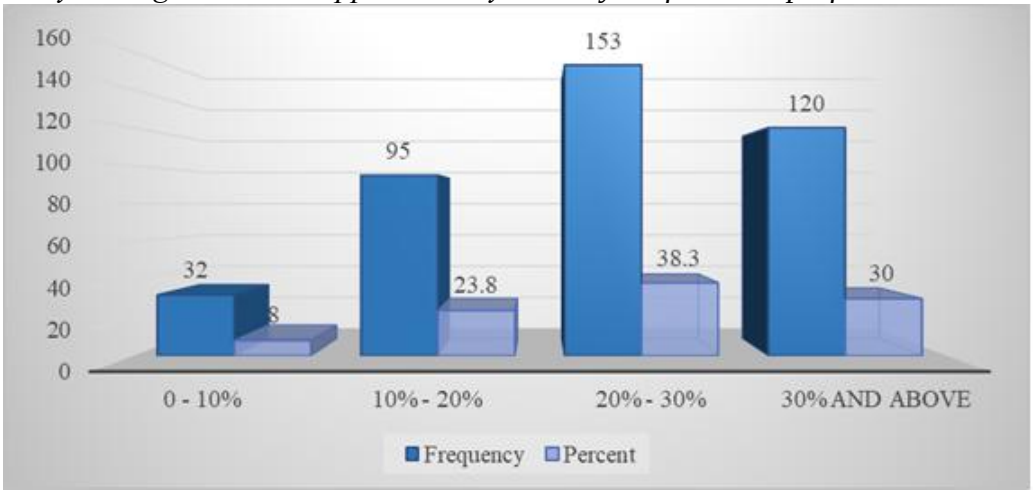


The above Table 4.26 assesses organizations' compliance posture with regulations. The largest proportion of respondents, 36.3%, rate their organizations as medium on compliance, indicating a moderate adherence to regulatory requirements. Meanwhile, 22.5% report a high on compliance posture, suggesting strong regulatory alignment. However, 28.2% indicate low on compliance, highlighting potential gaps or challenges in meeting regulatory standards. Additionally, 13.0% prefer not to disclose their organization's compliance status. The responses reflect diverse levels of regulatory commitment and preparedness among organizations, pointing to the importance of enhancing governance mechanisms and promoting openness in compliance practices.

Organizational Performance

Financial Performance

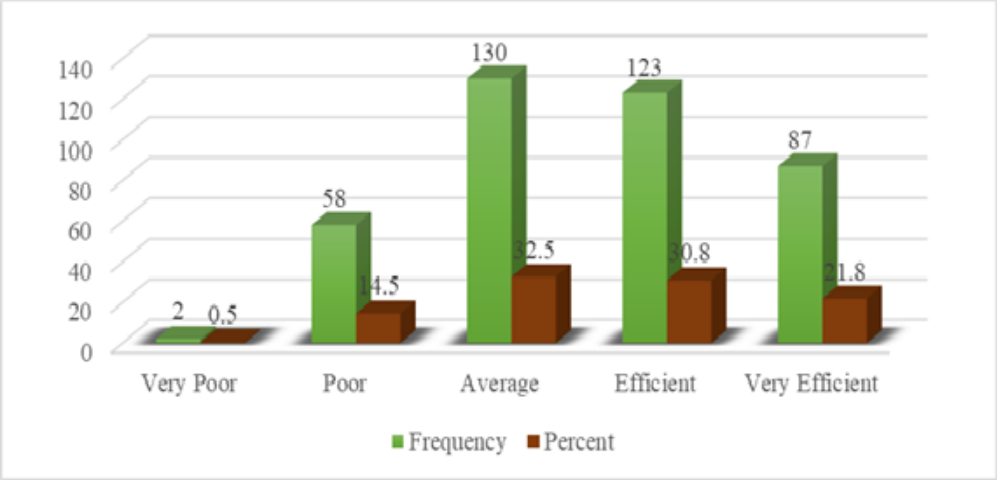
Figure 4.27
Please rate your organization's approximate year-on-year financial performance.



The organizations' approximate year-on-year financial performance is shown in Figure 4.27 above. Majority of respondents (38.3%) report a growth rate of 20% - 30%, indicating strong financial performance. Additionally, 30.0% of organizations have achieved a growth rate of 30% or above, reflecting exceptional financial success. Meanwhile, 23.8% of respondents indicate a 10% - 20% growth rate, suggesting steady but moderate progress. A smaller segment (8.0%) reports a growth rate of 0 - 10%, which may indicate financial stagnation or slower expansion. To summarize, most organizations are performing strongly in financials, with a considerable segment reporting above-average growth trajectory.

Operational Efficiency

Figure 4.28
How efficient are your organization's cost management and resource utilization?



The efficiency of organizations' cost management and resource utilization is shown in Figure 4.28 above. Most respondents, 32.5%, rate their organization's efficiency as average, indicating room for improvement. Additionally, 30.8% perceive their cost management as efficient, while 21.8% rate it as very Efficient. However, 14.5% of respondents report inefficiencies, rating their organizations as Poor, and a small 0.5% consider their cost management very poor. Overall, the results show a mixed working landscape, where many organizations perform well but a meaningful segment still faces efficiency-related challenges.

Customer Satisfaction

Figure 4.29
How satisfied are your customers with your organization's services? {e.g., basis Customer Satisfaction scores (CSAT score), Net Promoter Score (NPS)}

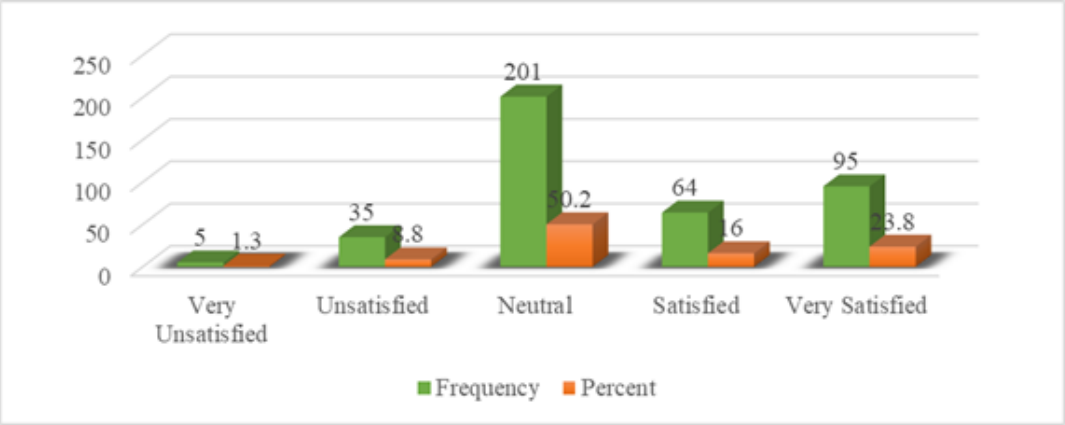
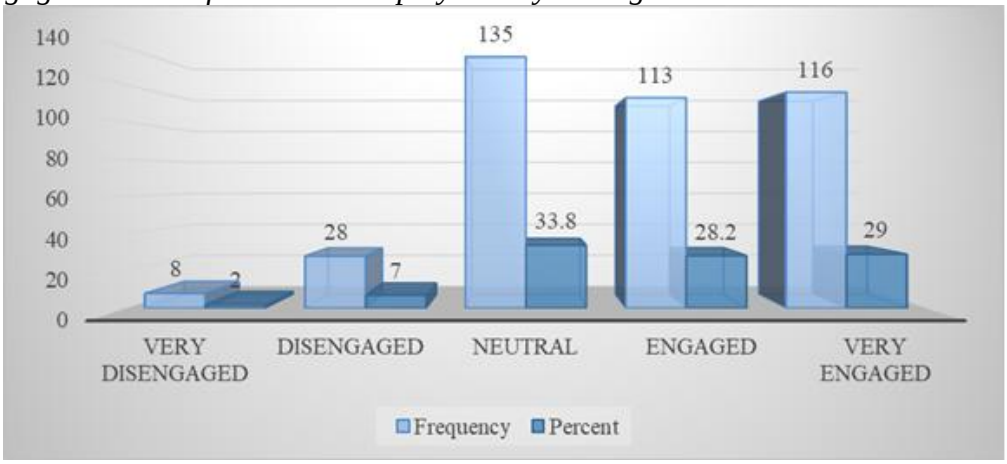


Figure 4.29 shows how measurements of customer service levels that organizations' offerings elicit from their target audiences. Quite a few people, 50.2% to be exact, are unsure. Also, many businesses seem to be living up to their customers' expectations, since 16.0% are satisfied and 23.8% are extremely satisfied. Nevertheless, 8.8% of customers are reported as Unsatisfied, with 1.3% expressing Very Unsatisfied. The results imply that although many organizations report high levels of customer satisfaction, the sizable neutral responses point to a gap in actionable feedback and customer insight mechanisms.

Employee Engagement

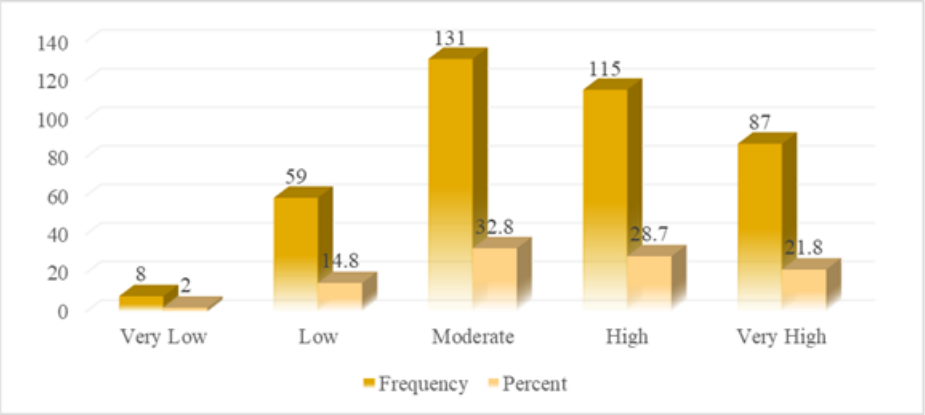
Figure 4.30
How engaged and satisfied are the employees in your organization?



The employee engagement and satisfaction within organizations as shown in Figure 4.30 above. A notable 28.2% stating employees are engaged, and 29.0% indicate they are very engaged, reflecting a motivated workforce. However, a significant 33.8% of respondents hold a neutral stance. On the lower 7.0% indicating employees are disengaged, and 2.0% stating they are very disengaged. Although employee engagement appears strong overall, the neutral and disengaged responses highlight areas where organizations could build stronger connections and enhance the employee journey.

Innovation and Research and Development (R&D)

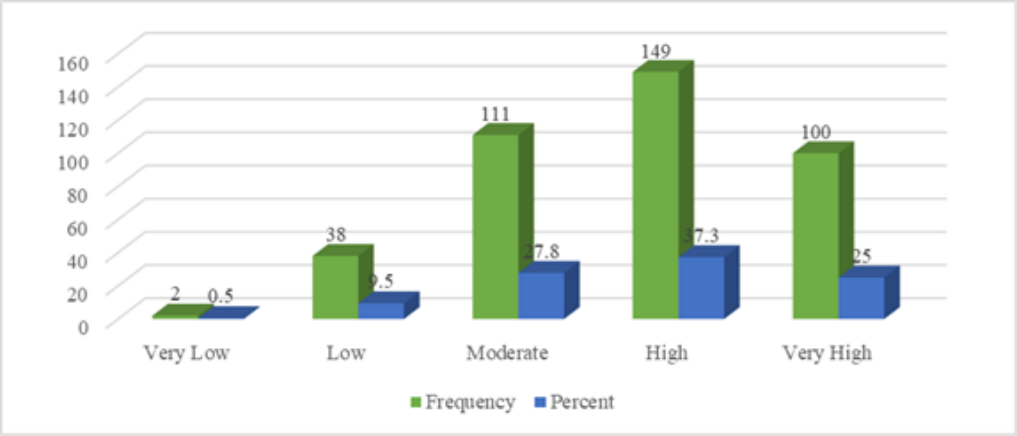
Figure 4.31
How would you rate your organization's investment in Research and Development (R&D) activities and the resulting output?



The evaluation of organizational investment in R&D Along with its resulting output is shown in Figure 4.31 above. A significant organization's R&D investment is high (28.7%) or very high (21.8%), indicating strong innovation efforts. Meanwhile, 32.8% of the respondents rate it as moderate, suggesting a balanced but potentially improvable approach. On the low (14.8%) or very low (2.0%), highlighting gaps in R&D prioritization. These insights suggest that while many organizations actively support innovation, a notable proportion still face challenges in elevating R&D to a strategic priority.

Reputation and Brand Value

Figure 4.32
How would you rate the perception of your organization's brand and reputation among shareholders?



The majority of respondents perceive their organization's brand and reputation positively, as shown in Figure 4.32 above, with high (37.3%) or very high (25.0%). Meanwhile, 27.8% of respondents view their organization's reputation as moderate, with their organization's reputation as low (9.5%) or very low (0.5%), which may indicate concerns regarding governance, transparency, or market positioning. The results reflect a mostly positive perception of organizational reputation, though a portion of firms may benefit from reinforcing their market credibility and investor confidence.

Social Responsibility

Figure 4.33
How effective are your organization's sustainability initiatives and compliance with environmental regulations?

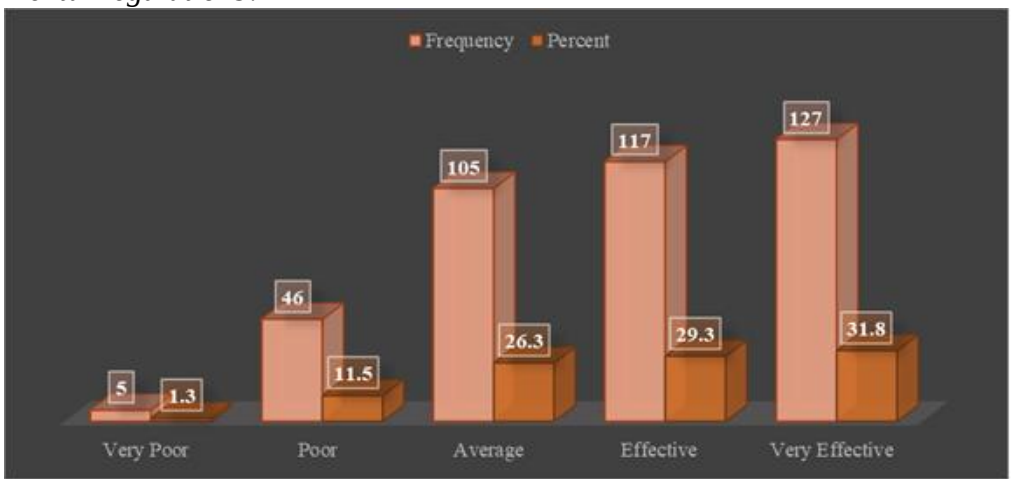
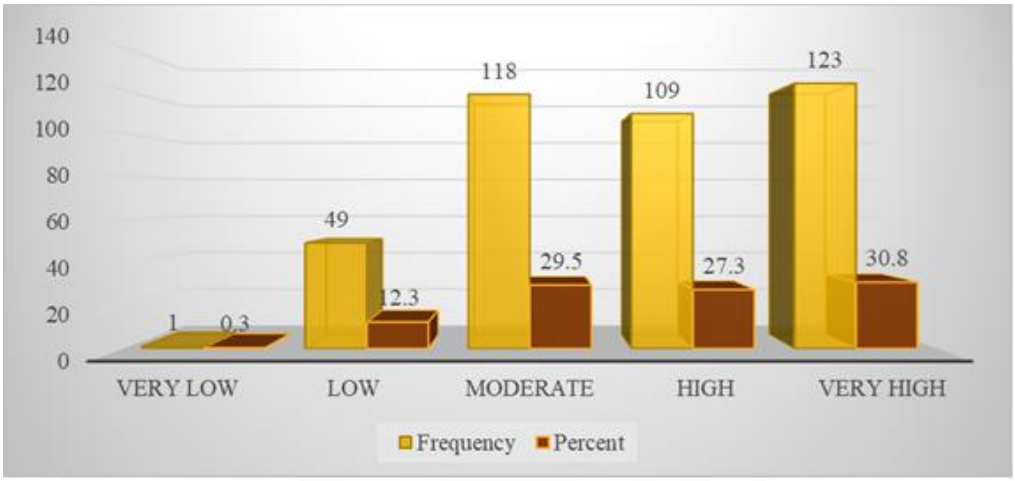


Figure 4.33 shows the organization's sustainability initiatives and compliance with environmental regulations. It shows that 29.3% of the initiatives are effective, and 31.8% are very effective. Approximately 26.3% of people think these efforts are average. However, initiatives are categorized as either poor (11.5%) or very Poor (1.3%), highlighting potential gaps in environmental policies, resource efficiency, or regulatory compliance. The results suggest that although many organizations are performing well in sustainability, some still face challenges in aligning operations with environmental responsibilities.

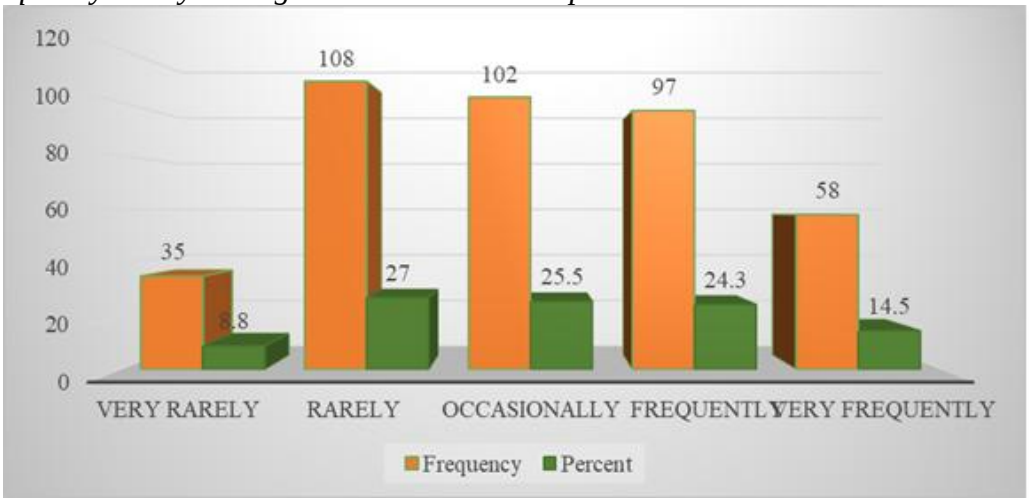
Figure 4.34
How committed is your organization to social responsibility and contributions to social causes?



The Organizational Commitment to Social Responsibility and Social Causes, as in Figure 4.34 above, shows a high (27.3%) or very high (30.8%), reflecting strong corporate social responsibility (CSR) engagement. Meanwhile, 29.5% rate the commitment as moderate; additionally, 12.6% of respondents believe their organization has a low (12.3%) or very low (0.3%) commitment, indicating potential gaps in CSR initiatives and social impact efforts. The findings indicate that while many organizations are actively involved in social responsibility efforts, others may still have opportunities to expand their role in addressing societal needs.

Risk Incidents

Figure 4.35
How frequently does your organization encounter operational risk incidents?



The organizations experienced operational risk incidents in Figure 4.35 shows that occasionally (25.5%), frequently (24.3%), or very frequently (14.5%), indicating a notable level of risk exposure. Meanwhile, respondents rated occur Rarely (27.0%) or very rarely (8.8%), suggesting that some organizations have stronger risk controls in place. The findings suggest that while some organizations manage operational risks effectively, others may benefit from strengthening their control measures to limit the occurrence of such incidents.

4.3 Hypothesis Testing

Findings of Hypothesis 1

Hypothesis 1: The maturity of data governance policy and procedures influences the degree of organizational effectiveness.

Table 4.2
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.545[a]	0.298	0.296	0.37180
a. Predictors: (Constant), DG				

According to the regression analysis summarized in Table 4.2, DG demonstrates a moderate positive correlation with OP, as indicated by R = 0.545. The R Square value of 0.298 shows that DG explains about 29.8% of the variance in OP. Meanwhile, the Adjusted R Square of 0.296, which accounts for the number of predictors, closely mirrors the unadjusted R Square, signaling a robust model fit. Lastly, the standard error of the estimate at 0.37180 highlights the typical deviation between observed outcomes and model predictions, thereby reflecting the precision of the regression model.

Table 4.3
ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	23.300	1	23.300	168.557	0.000[b]
	Residual	55.016	398	0.138		
	Total	78.316	399			
a. Dependent Variable: OP						
b. Predictors: (Constant), DG						

Analysis of Variance (ANOVA) for the regression model, displayed in Table 4.3, reveals that the residual sum of squares (55.016) captures variance not explained by the model, whereas the regression sums of squares (23.300) accounts for the portion explained by

DG. With a single degree of freedom (df = 1) for the regression and 399 for the residuals, the resulting F-statistic of 168.557 and p-value (*Sig.* = 0.000) highlight the model's statistical significance. This indicates that DG contributes meaningfully to variations in OP.

Table 4.4
Coefficients

Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	2.165	0.115		18.896	.000
	DG	0.457	0.035	0.545	12.983	.000
a. Dependent Variable: OP						

As seen in Table 4.4, the constant (2.165, p = 0.000) represents the baseline level of OP absent DG. The unstandardized coefficient (B = 0.457, p = 0.000) indicates a positive association between DG and OP, further strengthened by the standardized coefficient (Beta = 0.545). The t-value of 12.983, with a significance below 0.001, adds robust statistical support for the impact of DG on improving OP.

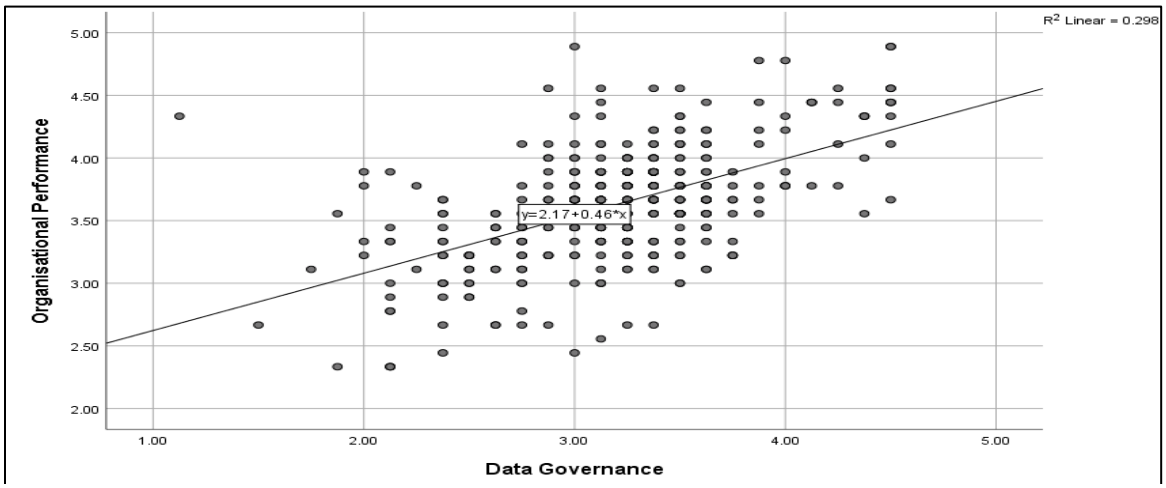


Figure 4.36
Scatter Plot Between DG and OP

Organizational effectiveness is positively and linearly correlated with DG, as shown in Figure 4.36. OP rises 0.46 units for every one-unit improvement in DG, according to the regression equation $y = 2.17 + 0.46x$. DG has a moderate correlation with OP, explaining 29.8 percent of the variance ($R^2 = 0.298$).

Sub-Analysis of Data Governance Variables

Beyond the overall finding that DG maturity promotes organizational effectiveness, a closer examination of specific DG variables reveals how they correlate with particular performance dimensions:

Top Correlations ($r \geq 0.20$)

- **Data Compliance → Customer Satisfaction**

  Organizations emphasizing compliance tend to score higher on customer satisfaction, likely indicating that regulatory adherence results in greater trust and service quality.

- **Data Governance Policy → Operational Efficiency**

  Frequent or consistently applied data governance policies align with more streamlined processes, pointing to improved operational outcomes.

- **Data Privacy → Employee Engagement**

  Robust privacy measures correlate with a more engaged workforce, suggesting that employee trust is bolstered by strong data-protection standards in employee data and customer personal data equally.

- **Data Ownership → Employee Engagement**

  Clear definition of ownership roles appears to enhance accountability and motivation, ultimately driving employee commitment to managing data as an enterprise asset.

- **Data Management and Integration → Reputation and Brand Value**
  Integrating and managing data effectively contributes to a stronger brand perception, possibly due to more reliable information delivery and stakeholder confidence through a shorter time-to-market
- **Data Governance Policy → Reputation and Brand Value**
  Consistent enforcement of governance policies may bolster the organization's credibility and brand image among stakeholders. As such implementation is often put on disclosures to shareholders that increases reputation basis the strength of the DG policy environment.

These sub-variable correlations lend additional support to Hypothesis 1, demonstrating that different facets of DG maturity can benefit distinct OP areas. In particular, active and frequently enforced DG policies, combined with compliance and ownership clarity, seem especially influential in improving customer satisfaction, employee engagement, and brand reputation, thereby reinforcing the overall assertion that DG maturity is key to organizational effectiveness.

Findings of Hypothesis 2

Hypothesis 2: CG influences the relationship between data governance practices and OP.

- **H2a: Data governance practices influence the organization performance.**

Table 4.5
Correlation

		DG	OP
DG	Pearson Correlation	1	0.545**
	Sig. (2-tailed)		.000

	N	400	400
OP	Pearson Correlation	0.545**	1
	Sig. (2-tailed)	.000	
	N	400	400

The correlation study between DG and OP is shown in Table 4.5 above. With a Pearson correlation coefficient of 0.545, we can see that the two variables are somewhat related. The correlation's statistical significance at the 0.01 level (p = 0.000) confirms the strength and reliability of this relationship. The sample size was 400 people.

- **H2b: Data governance practices significantly influence CG practices.**

Table 4.6
Correlations

		DG	**CG**
DG	Pearson Correlation	1	0.387**
	Sig. (2-tailed)		0.000
	N	400	400
CG	Pearson Correlation	0.387**	1
	Sig. (2-tailed)	0.000	

	N	400	400

DG and CG were shown to be correlated in the study's results as in Table 4.6. The Pearson correlation coefficient shows a weak positive relationship (r = 0.387) between the two variables. At the 0.01% level of significance (p = 0.000), there is a correlation between stronger CG and improved DG.

- **H2c: CG practices significantly influence the organization performance.**

Table 4.7
Correlations

		CG	**OP**
CG	Pearson Correlation	1	0.323**
	Sig. (2-tailed)		0.000
	N	400	400
OP	Pearson Correlation	0.323**	1
	Sig. (2-tailed)	0.000	
	N	400	400

The study inspects the correlation between CG and organizational success are presented in Table 4.7. The Pearson correlation coefficient (r = 0.323) indicates a moderate to strong positive association between the two variables. At the 0.01% level of significance (p = 0.000), there is a statistically significant association between better CG and higher OP.

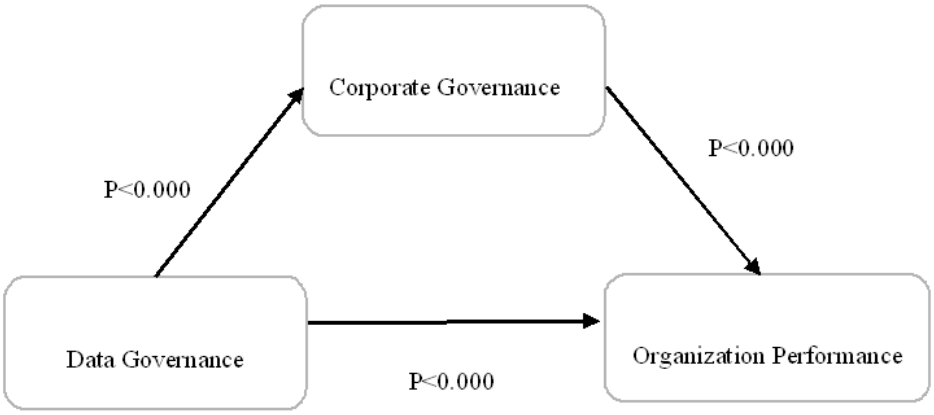


Figure 4.37
Conceptual Model for Mediation Analysis

This conceptual framework illustrates significant positive relationships between CG, DG, and OP in above figure 4.37. Strong CG practices, as well as robust DG frameworks, are both independently associated with improved OP (P<0.000 for both). Furthermore, effective DG also positively influences CG (P<0.000).

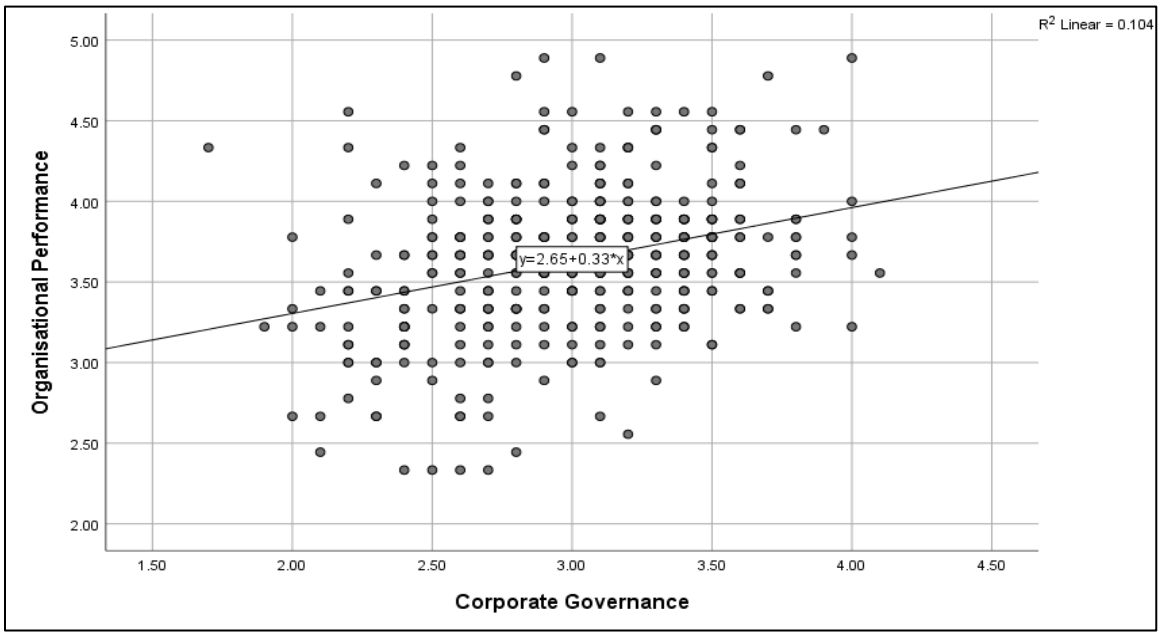


Figure 4.38
Scatter Plot Between CG and OP.

The correlation between CG (x-axis) and OP (y-axis) is seen in Figure 4.38, which is a scatter plot. The regression line equation, y = 2.65 + 0.33*x, shows a positive linear trend in the plot, indicating that better CG scores are connected with higher OP. The low R-squared value - 0.104 indicates that CG clarifies 10.4% of the variation in OP, indicating that other factors can have more impact.

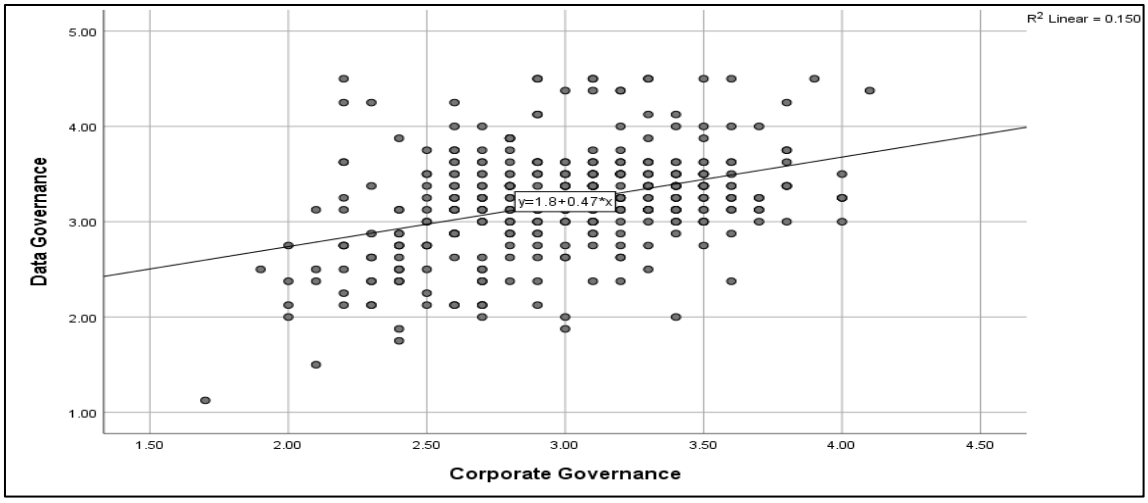


Figure 4.39
Scatter Plot Between DG and CG

Figure 4.39 is a scatter plot that looks at the relationship between two variables. The x-axis represents CG and the y-axis represents DG. A positive linear association is indicated by the regression line, which is described by the equation y = 1.8 + 0.47x. This line implies that greater CG scores are typically related with higher DG scores. With an R-squared value of 0.150, we can deduce that other variables account for 85% of the variation in DG, whereas CG explains just 15%.

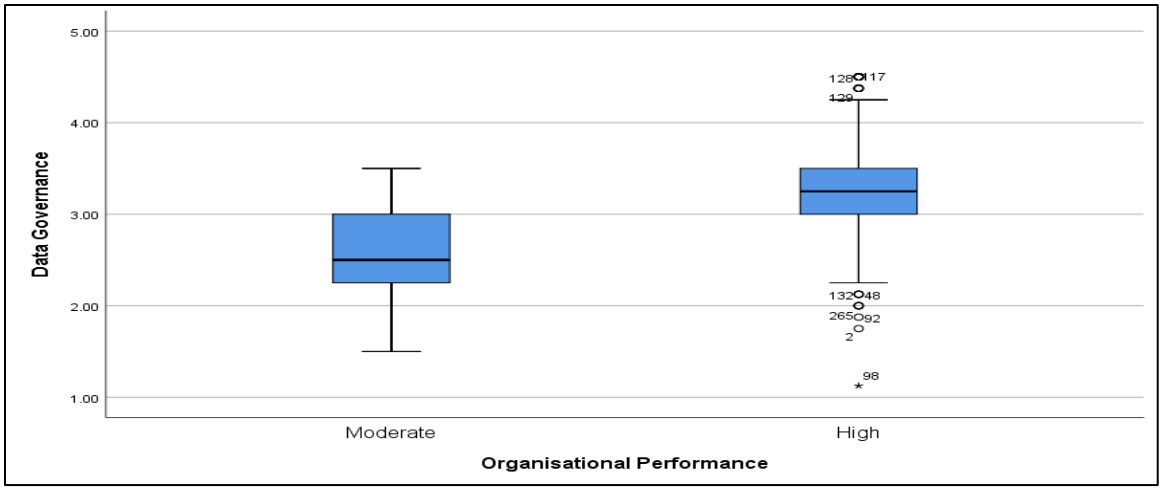


Figure 4.40
Box Plot Between DG and OP

This box plot in Figure 4.40 visually compares the distribution of DG scores across two categories of OP: "Moderate" and "High." The plot reveals that the median DG score is notably higher for organizations with high performance compared to those with moderate performance. The interquartile ranges (IQRs), represented by the boxes, also suggest greater variability in DG scores for the high-performance group. Additionally, the presence of outliers in both groups, particularly on the lower end for the moderate performance group, indicates some extreme cases of low DG scores regardless of OP level.

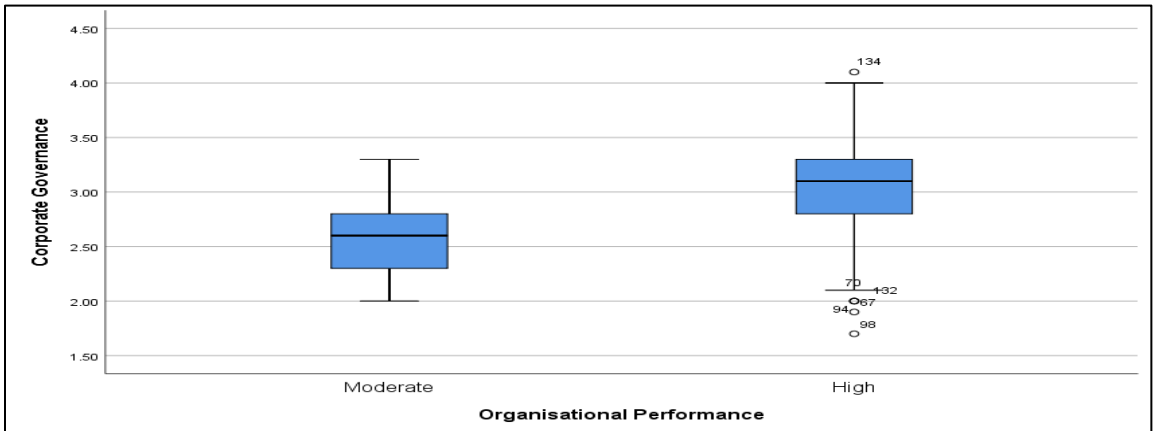


Figure 4.41
Box Plot Between CG and OP

This box plot in Figure 4.41 above compares the distribution of CG scores between organizations categorized as having Moderate and High OP. The data reveals that the median CG score is notably higher for the high-performing group, suggesting a positive relationship between CG and OP. While the interquartile ranges (IQRs), represented by the boxes, appear somewhat similar, the high-performing group exhibits a wider overall spread and a higher upper whisker, indicating potentially greater variability and higher maximum values in CG scores. Additionally, the presence of outliers in the high-performing group, particularly on the higher end, reinforces the observation of potentially exceptional CG practices within this category.

- **DG – OP**: The analysis indicates a positive association between DG and OP.
- **DG – CG:** The analysis indicates a positive relationship between DG and CG frameworks.
- **CG – OP:** The analysis indicates a positive relationship between CG and OP.

When taken together, the sub-hypotheses confirm that CG plays a significant role alongside DG in driving or reinforcing OP. While each variable independently impacts performance, the interconnected nature of DG and CG suggests that organizations benefit most when both governance dimensions are actively developed and integrated.

To supplement the correlation-based findings from H2a, H2b, and H2c, a moderation analysis was conducted to test whether specific CG variables have a strengthening or weakening effect proceeding the relationship between DG and OP. This advanced statistical method allows for testing interaction effects, thereby exploring whether CG not only independently influences performance but also alters how DG affects it.

Methodology for Moderation Analysis

The data was analyzed using regression-based moderation techniques applied through Python's statsmodels package. Normalized metrics were aggregated to form composite

indices for DG (DG Index) and OP (OP Index). Each of the nine CG (CG) variables was evaluated as a potential moderator using a regression-based moderation model of the form:

- *OP Index=β0+β1(DG Index) + β2(CG Variable) + β3(DG Index × CG Variable) +ϵ\text {OP Index} = \beta_0 + \beta_1(\text {DG Index}) + \beta_2(\text {CG Variable}) + \beta_3(\text {DG Index} \times \text {CG Variable}) + \epsilonOP Index=β0+β1(DG Index) + β2(CG Variable)+ β3(DG Index × CG Variable) +ϵ*

Where:

- β_1 captures the direct effect of DG on OP.
- β_2 represents the direct effect of the CG variable.
- β_3 is the interaction term, representing whether the CG variable moderates the DG–OP relationship.
- ε is the error term.
- A statistically significant β_3 coefficient ($p < 0.05$) was interpreted as indication of a meaningful moderation effect.

All continuous variables were standardized before interaction term creation to minimize multicollinearity. Separate regression models were run for each CG variable to isolate individual moderation effects. At a 95% confidence level ($\alpha = 0.05$), the significance of the model was assessed. The results revealed that three CG variables significantly influence the strength of the DG–OP relationship:

Table 4.8
Model Summary

CG Variable	**Interaction Coefficient**	**p -value**
Risk Management Policy	0.193	0.001

Regulatory Compliance	0.197	0.007
CEO Chairperson Duality	0.172	0.016

The presence of a structured risk management policy as in Table 4.8, strong adherence to regulatory compliance, and leadership separation (via CEO-chairperson duality) significantly enhances the effect of DG efforts on organizational outcomes. These findings align with the notion that an effective CG framework acts as an enabler for data-driven value creation.

Findings of Hypothesis 3

Hypothesis 3: The OP is positively impacted by the convergence of CG goals with DG goals.

This hypothesis testing moves beyond isolated effects to test whether integration across governance domains produces superior outcomes. To evaluate this hypothesis, a simple linear regression model was applied where the independent variable was a constructed metric representing the "Convergence of Corporate and DG", and the dependent variable is OP. The model is expressed as:

$$OP=\beta 0 +\beta 1 (Convergence)+\epsilon$$

- Convergence echoes how closely aligned data and CG objectives are within the organization.

- OP is the denoted and measured outcome of OP, derived from metrics such as efficiency, innovation, satisfaction, and compliance.

Table 4.9
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.533[a]	.284	.282	.37533

a. Predictors: (Constant), Convergence of CG and DG

The regression study that evaluated the combined influence of CG and DG on OP is summarized in Table 4.9, which is located above. Alignment of these governance approaches with OP is moderately positively associated (R = 0.533). Corporate and DG together explain 28.4 percent of the variation in OP (R Squared = 0.284). Taking into account all of the predictors, the Adjusted R Square (0.282) is extremely close to R Square, indicating that the model is stable. The estimate's standard error is 0.37533, which indicates the extent to which actual results differ from projections.

Table 4.10
ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	22.250	1	22.250	157.946	.000[b]
	Residual	56.066	398	.141		
	Total	78.316	399			

a. Dependent Variable: OP

b. Predictors: (Constant), Convergence of CG and DG

The regression model explains a significant amount of the variability in the dependent variable, as seen in ANOVA table 4.10. The total of the squares from the one-degree-of-

freedom regression is 22.250, which gives us the mean square. Based on the model's independent variable or factors having a substantial impact on the dependent variable ($p < 0.05$) and an F-statistic of 157.946, this appears to be the case.

Table 4.11
Coefficients

Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	1.809	0.146		12.363	.000
	Convergence of CG and DG	0.587	0.047	0.533	12.568	.000
a. Dependent Variable: OP						

OP is shown as the dependent variable in Table 4.11, with the coefficients showing the connection between the independent variable (Convergence of CG and DG) and the dependent variable. There is statistical significance ($p < 0.05$) with an unstandardized coefficient for the constant of 1.809, as shown by a t-value of 12.363 and a standard error of 0.146. The unstandardized coefficient for the independent variable is 0.587, and the standard error is 0.047. There is a weakly positive connection between this statistic and OP (beta = 0.533). The organizational success is significantly affected by this variable, as indicated by the t-value of 12.568 and p-value of 0.000.

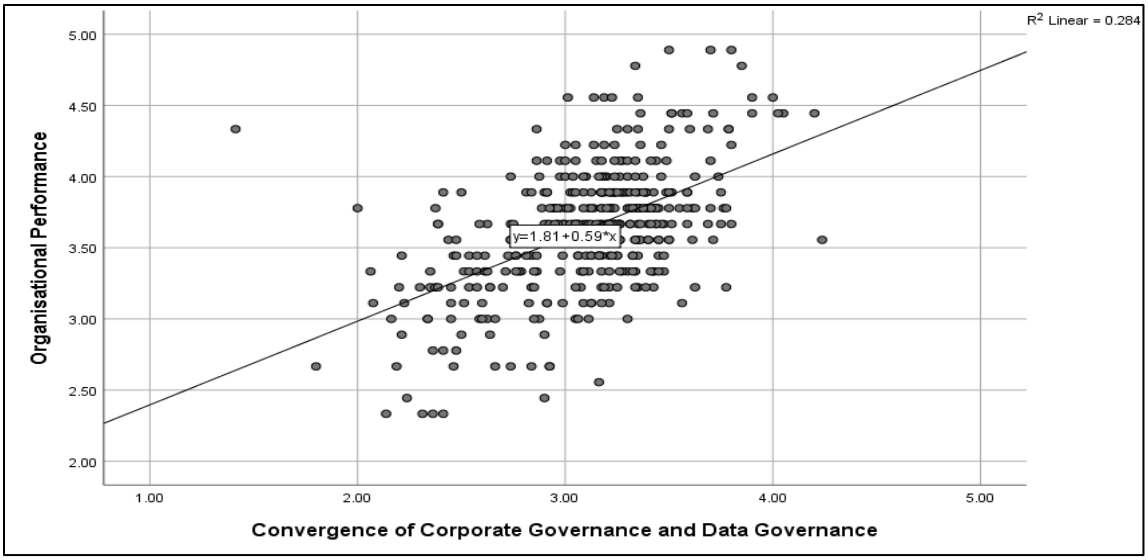


Figure 4.42
Scatter Plot Between Convergence of CG and DG and OP

Above Figure 4.42 shows a scatter plot examining the relationship between the convergence of CG and DG (x-axis) and OP (y-axis). The plot reveals a positive linear trend, as indicated by the regression line equation y = 1.81 + 0.59x, suggesting that higher convergence scores are associated with higher OP. An R-squared of 0.284 means that the convergence of DG and CG accounts for about 28.4% of the variance in OP.

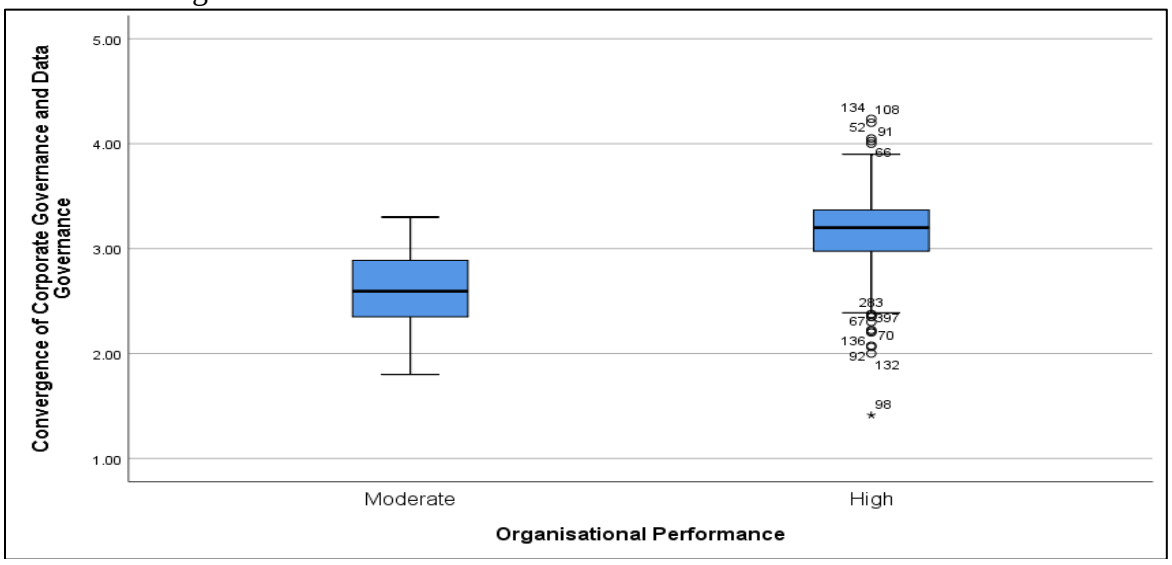


Figure 4.43
Box Plot Between Convergence of CG and DG and OP

This box plot is shown in Figure 4.43 compares the distribution of the "Convergence of CG and DG" scores across two categories of OP: moderate and high. The data shows a clear trend of higher convergence scores in the high-performing group, as indicated by the higher median and upper quartile. While the interquartile ranges (IQRs), represented by the boxes, show some overlap, the high-performing group's distribution is distinctly shifted upwards, suggesting a relationship that is positive between the convergence of governance practices and organizational success.

4.4 Summary

This study inspects effects of DG, CG, and their combination on OP. The results show that DG is impactful on OP. DG has an essential role in improving operational effectiveness, as established by the regression model analysis, shown by the high variance in OP. The correlation analysis also supports this relationship, DG and OP revealing a moderate association.

The study then explores the relationship between CG and DG. The analysis suggests that CG positively influences DG, reinforcing the interdependence between governance structures. Additionally, CG is shown to have a substantial impact on OP, though its effect size is relatively lower compared to DG. The results thus suggest that organizations with stronger CG frameworks will exhibit higher levels of OP.

The research further analyzes how DG and CG interact to affect business outcomes. An applied alignment between both the governance practices improves overall organizational outcomes, as shown by the analysis. This shows that these governance mechanisms including DG and CG have a positive and statistically significant effect when they interact or combine their objectives. However, each governance component individually contributes to OP yet their integration shows a more noticeable impact.

Organizations should make DG and CG top priorities and make sure they are strategically aligned by objectives, according to the analysis report. This will help organizations achieve better performance outcomes.

4.5 Conclusion

In this chapter, we looked at the impact of DG, CG, and their combination on the efficiency of firms. DG significantly and moderately improves organizational effectiveness, according to the results. Similarly, CG contributes to OP, although its effect is relatively lower. The study further establishes that CG positively influences DG, reinforcing its interdependent nature.

OP is more strongly influenced by DG and CG when both are implemented together. This shows how crucial it is to integrate and align governance practices to get the best outcomes. These relationships are supported by the statistical studies which include visual representations in the form of tabular analysis, correlation, and regression methods.

Overall, the chapter highlights that organizations should focus on strengthening both governance structures and their alignment to drive sustained performance improvements and long-term success in organizations.

CHAPTER V:

DISCUSSION

5.1 Discussion of Results

The study critically examined relation between Data Governance (DG) and Corporate Governance (CG). It thus revealed that their relationship is not just linear but is dynamic and mutually reinforcing. Drawing from both the theoretical foundations and empirical validations from the findings show better nuances of the interaction between the governance frameworks that influence Organizational Performance (OP). This

research builds a theoretical framework, with the purpose of improving OP. The results from the empirical analysis confirm that DG has an important role in steering OP as well as strategic agility (Al Wahshi et al., 2022). Organizations with mature DG practices demonstrate significant improvements in areas such as operational efficiency, employee engagement, customer satisfaction, reputation, along brand value. However, in line with prior scholars, the findings recognize that DG alone does not account for the complete variation in performance on organizations. A significant model validation strengthens the reliability of this relationship. This demonstrates direct improvements between DG practices and organizational efficiency.

Importantly, the results highlight the moderating influence of CG (Ali, 2024) while there is a positive relation between DG and CG. Organizations that implement strong DG practices typically develop robust CG systems driven by accurate data insights and disclosures. As organizations follow ethical standards of managing data under regulations, their compliance with broader CG measures is also established, thus creating broad accountable systems (Bernardo et al., 2024). However, CG in isolation was found having a weak influence on OP compared to DG.

The results support a more modern view - CG and DG are not just parallel mechanisms, but when integrated into overall goals, deliver meaningful performance improvement. Organizations achieve better results when they integrate their CG mechanism with formal DG structures, as governance functions must operate within unified ecosystems. Organizations wanting to enhance their performance must prioritize the alignment of corporate oversight structures and data management strategies, as this convergence has become dynamic (Sari, 2023).

Scatter plots reveal moderate but consistent correlations between governance maturity and better organizational outcomes. Yet the relatively low explanatory power of

CG in some regression models reveals that OP is multifactorially affected by configuration factors such as cultural, technological, and external market conditions. The analysis using box plots confirms that organizations that excel in governance processes show better performance, yet it reveals that other institutions do not achieve the same results through these principles (Guluma, 2021).

Finally, the findings promote a strategic integration of data and CG as the way to sustainable competitive advantage. Rather than viewing compliance and governance as static checkboxes, organizations should treat them as dynamic capabilities that enable better innovation, risk management, compliance, and strategic decision-making along with resilience (Naguib et al., 2024). This is particularly crucial in the financial sector, where governance maturity translates directly into trust amongst shareholders, stability, and long-term profitability (Atuahene and Xusheng, 2024).

5.2 Discussion of Research Question One

What factors in DG drive performance improvements, and how can executives and data leaders effectively embed these practices into the organization?

Findings from regression analysis confirmed that mature DG policies along with procedures significantly influence OP, explaining 29.8% of the variance observed ($R = 0.545$, $p < 0.001$). These findings validate Hypothesis 1 and highlight DG as a crucial enabler of performance improvement in organizations. DG today is not a good-to-have function; it's a strong necessity. As organizations compete in increasingly regulated and digitally connected markets, data must be treated not just as a static asset but must be

actively managed and governed. For this change in the governance of data to succeed, the functions cannot operate in silos, it must be embedded into business models, enabled by leadership, and integrated into the enterprise. The alignment of CG with data management defines resilience as well as sustenance of modern organizations.

Adaptive DG Models rather than Static Models

The foundation of effective DG begins with a well-defined operating model. The study highlighted that consistently applied DG policies are related to improved operational efficiency. This reinforces that rigid frameworks are inadequate in dynamic conditions that organizations operate in. It also confirms that governance maturity contributes directly to streamlined processes and improved organizational outcomes. The DG model must integrate data ownership, stewardship, accountability, and access controls not just as policy artifacts, but as operational elements in business divisions. Without clarity in roles, escalation paths, and risk as well as compliance thresholds, governance remains static.

An effective DG strategy must be grounded in an evolutionary operating model that is both nimble and adaptive. One-size-fits-all frameworks often don’t work in organizational complexity or changing regulatory mandates. Instead, governance should be embedded through contingency-based operating models where controls, roles, responsibilities, and escalation paths are adaptable based on the criticality of an event, business context, importance of data elements, and maturity levels. Organizations must evolve from governance committees towards service-based governance models, where quality, metadata, Modeling, engineering, privacy, and security are managed as interdependent services. In this model, governance isn't considered as an afterthought but delivered through reusable patterns across business and IT, right from the initiation of a business change. Governance services are integrated into data lifecycle events such as

acquisition, ingestion, transformation, and archival. This enables execution within operational flows rather than after-the-fact implementation. Furthermore, the study indicates that consistent enforcement of DG policies not only drives operational efficiency but also enhances organizations' brand reputation, as stakeholders and shareholders relate strong governance practices with trust, transparency, and corporate resilience. Thus, integrated governance practices align into line specific findings that effective management of data and integration in organizations strengthens their brand value and stakeholder confidence by reducing time-to-market and ensuring accurate disclosure and information delivery to customers and regulators. Such operating models allow firms to institutionalize governance as an evolutionary capability measured, matured, and realigned as required, as the business model evolves.

Leadership and Cultural Embedding

CXOs must extend DG from the IT departments and into the boardroom. As Cheong and Chang (2007) studied DG delivers true value only when it's a part of the organization's strategy. In practice, this means establishing formal governance councils, integrating Key Performance Indicators (KPIs) of data management and governance into business scorecards, and ensuring that stewards and owners are enabled. This echoes the study's finding that clear data ownership roles significantly enhance employee engagement by nurturing accountability in data, specifically privacy. Orange (2020) stresses that aligning data and business processes together with strategic business objectives is required in balanced scorecard to create value. The empirical results further indicate that organizations with strong data compliance frameworks report higher customer satisfaction. This nuance highlights that regulatory adherence not only reduces risk but also builds trust and service quality among stakeholders. DG culture is refined through behaviour, not just structure. The procedures must extend into middle-

management through accountability, KPIs, and frontline personnel equally. That means investing in awareness programs, change agents, and governance playbooks makes governing data a shared responsibility across the enterprise.

Trustworthy data is essential for valuable insights and thereby decisions across various levels. Issues in data quality in an organization isn't just a technical issue, it’s an enterprise risk. Further, organizations struggling with inconsistent naming conventions, duplicate records, and inconsistent for CXOs must embed governance mats often lead themselves to lost opportunities and bad decisions along with regulatory risks. Likewise, Loshin (2011) emphasized that quality is the cornerstone of reliable decision-making in organizations. Today, AI-enhanced data quality platforms are detect anomalies real time, automate profiling, as well as enrich metadata using large language models. Data managers should focus not only on cleansing but on preventing issues by deploying automated rule runs, machine learning models, and continuous profiling systems (Hosseinzadeh et al., 2021). Standardizing quality frameworks across business units also eliminates data silos. The result is not just consistency but consistent in how data supports cross-functional execution in projects and programs and even in operations. The study reinforces that data quality management, as a core component of governance maturity, directly supports cross-functional execution and mitigates enterprise risks associated with poor data practices.

As regulatory scrutiny and threat surface area are increasing, governance must extend into data protection and digital trust. Admass et al., (2024) emphasize the need to govern data across its entire lifecycle. Data security cannot be just turned on and off, and it must be baked into governance controls. CXOs and CISOs must collaborate to build governance systems that can predict risk and not just respond to incidents. This includes classifying sensitive data, deploying identity-based access controls, automating

compliance monitoring, and simulating breach response scenarios. Executives must also champion regular risk assessments and board-level visibility into data vulnerabilities. The findings highlight that robust data privacy processes relate to higher employee engagement, suggesting that protecting personal and sensitive data nurtures trust within the grassroots as well as with customers. As employees understand the "why" behind governance, ranging from avoiding fines to protecting customer trust, compliance becomes cultural, not procedural. (Pool et al., 2024).

- **CXOs** should integrate governance into the culture of organizations, thus driving required investment, defining metrics, and having leaders accountable for data-based outcomes.
- **Business professionals** must translate policy into execution, thereby aligning governance with business processes, decision systems, and customer-facing applications.
- **Data managers and stewards** must architect systems that are self-healing, automated, auditable, and observable, hence ensuring that governance policies are not just deployed but monitored, measured, and iterated. This operational discipline aligns with the study's conclusion that governance maturity is a dynamic capability that directly influences customer satisfaction, operational efficiency, employee engagement, and brand reputation.

As Kayikci and Khoshgoftaar (2024) note, governance is most impactful when insight flows from the top down and feedback flows from the bottom up in an organization. This continuous refinement turns governance into a value-creating function rather than a control function.

5.3 Discussion of Research Question Two

Does CG moderate the relationship between DG practices and OP, and which governance mechanisms are most influential?

Moderation analysis confirms CG strengthens the relationship between DG practices and OP, thus validating Hypothesis 2. Specifically, risk management policies, regulatory compliance frameworks, and leadership separation (CEO-chairperson duality) have been identified as key CG mechanisms amplifying DG's impact on performance outcomes.

Just by investing in DG, performance improvements may not emerge. The true improvement in performance comes from aligning DG with enterprise-wide decision systems, monitoring, and accountability structures. The effectiveness of the approach is influenced by the degree to which organizational leadership provides consistent support, resource allocation, and direction. DG lays the operational groundwork, while CG provides the directional compass. The following sections explore how specific governance mechanisms, validated by the analysis, contribute to this moderating effect.

Key Governance Mechanisms Strengthening Performance

Organizations that recognize data as a core business enabler are the ones that take the full benefits of DG. Stedman (2022) argues that governance frameworks, leveraged as business tools rather than static policies by large organizations, result in performance advantages. Enterprises that have adopted active governance of data and attained a certain level of maturity in their program exhibit accuracy in decision making, optimization of costs, and also speed of delivering insights (Stedman, 2022). In line with this perspective, when enterprises manage and govern data across their lifecycle stages from planning, acquisition, storage, maintenance, along archival, and they merge these activities along with reducing the re-work due to quality of data and duplication, the enterprise can save on costs, time, and reputation.

When data is managed in a reactive and ad-hoc way, delays, errors, and inconsistent reporting erode confidence at every level of the business. This holds for organizations in highly regulated sectors like banking, healthcare, and telecom, where regulations related to data, its governance, privacy, and security keep evolving. As Nwoke (2024) and Akang (2024) state, DG frameworks built in line with regulatory requirements reduce fines and also build investor confidence and improve market positioning. This brings into line the study's finding that strong regulatory and compliance frameworks within CG pointedly enhance the effectiveness of DG in driving OP. The effectiveness of DG is also influenced by the degree to which leadership provides consistent support and direction. As evidenced by the study, these improvements are significantly amplified through leadership structures like CEO-Chairperson duality.

Ethical Governance as Oversight

In domains where customers are given importance in the business model, data practices will have to be ethical as well as transparent, and more recently, organizations with governance functions that enable both these aspects have become torchbearers. In an economy where trust is a competitive enabler, organizations embrace ethical AI and clear data usage practices to attract and retain customers (Rosário and Dias, 2023). These organizations do more than just comply with regulations; they produce loyalty while making governance mechanisms quite visible. Reflecting these viewpoints, CG moderates ethical direction and risk perspective of DG functions, thus translating data operations into performance outcomes

The impact of DG on performance is amplified or reduced by the effectiveness of CG in organizations. Organizations that perform well refrain from running DG as a back-office function; they extend it to the boardroom (Caluwe et al., 2024). When leaders in

organizations consider data as asset rather than compliance liability, chronicles change, and so do the outcomes (Caluwe et al., 2024). Findings validate the fact that active board involvement, particularly in risk management policies, significantly strengthens the positive relationship between DG and OP. So, board-level risk management policies are critical moderators in achieving greater performance outcomes. Across Fortune 500 firms, the ones that exhibited better financial results are the ones that have extended their DG initiatives to the boardrooms (Siddiqui et al., 2023).

Governance Maturity, Investment, and Resilience

One of the key enablers here is investment prioritization. The maturity of DG influences how firms allocate budgets for data infrastructure, information security, and artificial intelligence. Organizations that have well-established governance models invest up to 40% more in data-driven technologies like cloud and AI platforms than those with reactive or immature governance (Bokhari and Myeong, 2023).

On the flip side, where organizations have underdeveloped or disengaged CG, significant gaps emerge. Often, inadequate funding, inconsistent policies, and weak controls expose the organization to security breaches, customer churn, and reputational risk. Non-existence of ethical guidance can also increase the chances of AI misuse through either data discrimination or privacy violations that can reduce brand equity and incite regulatory action (Feijóo et al., 2020). This aligns closely with the identification of risk management and regulatory compliance as critical moderating factors, where their absence diminishes the performance benefits of DG.

Strong CG improves responsible data use and ethical AI, aligning with this study's identification of risk management and compliance as key moderating factors (Kalkan, 2024). Governance maturity also correlates with resilience in a posture of Information Security. In firms with strong governance, clearly defined roles, escalation protocols, and

accountability maps ensure that governance isn't just about policy, it's about control in the moments that matter most (Petru-Cristian, 2023). This supports the empirical conclusion that structured leadership, as seen in CEO-Chairperson duality, moderates effectiveness of DG under burdening scenarios such as audits and breaches.

Conclusion: CG as a Strategic Moderator

As organizations implement DG and CG with alignment, clarity, commitment, and accountability, the result is not just better data but better business. Organizations must treat governance not as compliance, but as an enabling strategy. And that strategy must evolve with the organization adapting to changing business models, customer expectations, and risk landscapes. In conclusion, the findings from Hypothesis 2 validate that CG serves as a critical moderator, thereby amplifying the positive effects of DG on OP through mechanisms such as risk management, regulatory compliance, and leadership accountability structure. Thus, CG through its moderating role converts DG from an operational function into an enabler for sustained OP.

5.4 Discussion of Research Question Three

How does interaction between CG principles and DG practices influence OP in firms?

This section addresses the evolving dynamics between CG principles and DG, with a specific focus on how their intersection affects OP. OP can only be improved through finding any gaps between DG practices and CG and fixing them (Karmakar and Dutta, 2022). The findings from the analysis reiterate the fact that strategic alignment between corporate and DG drives increased transparency and enables insight-driven decisions. Yet, this positive influence is dependent on governance maturity, leadership clarity, and execution capabilities, as highlighted by the study's findings. As alignment is brought between these frameworks, this can result in organizational excellence along

with a competitive advantage. This research indicates that governance design elements like clearly separated executive roles, formal risk oversight, and consistent regulatory adherence amplify the influence of DG on performance metrics.

Integrated Governance as Strategic Enabler

The evidence suggests that CG delivers the required management structures along with the necessary oversight that enables data to be governed through a DG function. Karmakar and Dutta (2022) highlight that organizations with strong board-level involvement in data initiatives tend to exhibit improved decision-making quality and greater agility in responding to regulatory demands and market dynamics. As shown by the empirical analysis, governance convergence enhances decision-making speed. The presence of executive data leaders, such as Chief Data Officers (CDOs), and defined ownership protocols converts data from being a passive asset to a core driver of performance (Lowry et al., 2024).

Accountability, Ownership, along with Stewardship

CG sets clear expectations for data ownership and stewardship by identifying roles and assigning accountability across business units. Samans and Nelson (2022) argue that the DG Survey Section's structures support responsible data handling and reduce ambiguity about who manages critical data. Organizations in AI-intensive sectors need to have a definitive alignment with corporate values and regulatory fairness. Ethical data handling practices must be rooted in organizations through governance structures. Such an alignment enables a critical role in mitigating AI bias, managing privacy risks, and ensuring algorithmic fairness. These are areas where gaps in governance can lead to reputational and regulatory risks that can be costly.

Regulatory Compliance, Risk Mitigation, and Reputation Management

A DG function helps firms to manage risk while also staying compliant with national and international data protection laws. DG, under the direction of CG, provides organizations with the necessary control frameworks. Such a control environment can include encryption, multi-layer authentication, and access management to reduce threat exposure to breaches.

Findings showcase that integrating DG within corporate compliance structures can result in reduced regulatory risk and enhanced stakeholder trust. Lacity and Carmel (2024) too note that these mechanisms are just not technical safeguards but are increasingly seen as strategic enablers in regulated industries like finance, where risk needs to be actively managed. As noted earlier, integration of DG within compliance programs reinforces stakeholder trust and reduces reputational exposure. Khogali and Mekid (2023) state that oversight that is not up to the mark can result in ethical lapses, data misuse, and long-term damage to stakeholder relationships. Including transparency and accountability in the data objectives can help organizations protect their brand and sustain public expectations around privacy and fairness.

Driving Operational Agility and Business Intelligence

From a performance standpoint, efficient DG systems contribute to improved operations and accurate decision-making. When CG supports data-driven transformation, organizations can take advantage of insights from predictive analytics, AI, customer intelligence, and forecasting tools (Allioui and Mourdi, 2023).

Influencing Organizational Culture and Investment Choices

An often-overlooked but critical role of CG lies in shaping data-driven cultures, and it is gaining momentum with awareness in the regulated industry. Arokiasamy and Arumugam (2023) argue that when governance bodies support ongoing training, awareness, and ethical data use, it fosters a workforce that understands and respects data

stewardship involvement in regular operations. CG plays a direct role in planning decisions, often prioritizing data, analytics, and AI investments that align with long-term performance and compliance goals. Firms with robust oversight mechanisms tend to invest in scalable, secure technologies like cloud platforms, machine learning tools, and blockchain to stay competitive in the long term. The research highlights that governance alignment not only influences investment decisions but also fosters a culture of data accountability, driving sustainable performance improvements. On the other hand, weak governance often correlates with underinvestment, technical debt, and slower innovation cycles.

Building Customer Trust

This study confirms that the convergence of CG and DG objectives maintains compliance, AI ethics, and customer trust. As customer expectations around data transparency continue to rise, firms must use governance structures to publish clear policies on acquiring, using, storing, and accessing data. According to Rane et al. (2023) organizations that follow DG tend to build stronger brand loyalty and attract privacy-conscious customers. Oversight on AI initiatives and LLM Operations is no longer optional, it is now central to maintaining operational lawfulness and social trust. Without structured oversight, artificial intelligence (AI) applications risk introducing biases, hallucination, or producing decisions that are unexplainable and unfair. Corporate and DG must jointly have oversight on AI ethics to ensure compliance, explainability, and equity in outcomes.

Limitations, Risks, and Context-Specific Challenges

While governance integration and alignment drive performance, the study also finds that over-engineering frameworks or a lack of clear ownership can hinder agility and innovation, particularly in smaller firms. For smaller organizations with lean

resources, establishing parallel governance frameworks can become a drain on time, budget, and focus. Without clear ownership and prioritization, governance efforts risk turning into administrative overhead rather than delivering tangible outcomes. Over-engineered governance structures can stall innovation, slow response times, and create internal resistance, especially in fast-paced or decentralized environments. In industries or business divisions where responsiveness is a differentiator, excessive governance may slow down reaction to events, execution, and create decision fatigue. The design must therefore balance data oversight with the enablement of data management.

Conclusion: Governance Convergence along with OP

In conclusion, the study highlights and argues that organizations leveraging integrated governance frameworks can achieve sustainable performance as well as resilience. This convergence enhances operational efficiency, ethical integrity, regulatory compliance, and competitive advantage. However, the success depends on having mature governance practices tailored to the culture, clear leadership and accountability structures, and flexible execution customized to the organization's strategy.

CHAPTER VI:

SUMMARY, IMPLICATIONS, AND RECOMMENDATIONS

6.1 Summary

Focus of this study is exploring how DG, together with CG, affects OP. This also shows how governance frameworks enhance performance through actively managing risks and promoting efficiency in operations, and regulatory preparedness when well

implemented. These findings prove to be of value as two aspects of governance are simultaneously integrated seamlessly to achieve sustainable success.

The Role of Data Governance (DG)

DG is an important function across organizations to enhance efficiency with which data is managed, thereby resulting in better strategic decisions and customer trust. Organizations that put a great emphasis on DG are likely to be better at meeting regulatory compliance, minimizing business risks, and drawing on the data to bring about a competitive advantage. Well-articulated DG policies give direction to employees and executives equally to simplify their data processes and to integrate them into everyday changes. Furthermore, top-performing organizations with their DG in place would do better on their outcomes, as data supports good decision strategies.

Implementation of DG processes anchors operational efficiency, business intelligence, and assists in meeting regulatory requirements. Businesses thrive because the decision process is effective, resource supply pathways are optimized, and predictive data analytics, along with artificial intelligence insights, are accurate. DG is no longer an option in this era of digital transformation; It is a must to keep an organization relevant and agile.

The Role of CG

As organizations embrace governance mechanisms, stakeholders retain trust in the organization’s potential to generate long term value. By keeping the company's objectives and ethical standards in mind, good CG ensures that leadership, board of directors, and internal controls are aligned.

Corporations’ governance practices should be properly executed, and this leads to higher levels of DG achievement. CG practices, when properly integrated in organizations, lead to higher maturity of DG processes. Organizations that integrate DG

with corporate oversight demonstrate better outcomes than those that do not align governance practices. By following this nuance, strategic investments can be made in data infrastructure, data operations, information security, and data analytics, along with artificial intelligence that lead to improved management of risks and market positioning. On the contrary, less governed organizations will attract issues like siloed data, high data risk, and further cascade to reputational risks, unsatisfactory market performance.

Interesting as it is, CG has a reduced impact on operational efficiency compared to DG, however, the strategic direction that organizations set is heavily dependent on it. Organizations that have governance structures operationalized actively across operations and finance can mitigate uncertainties and are high on regulatory preparedness.

The research analysis shows that the combination of CG principles and processes with DG structures increases organizational effectiveness. The CG functions drive management to make organizations better decision-makers and risk managers. Financial institutions emphasize the importance of proper CG because it is more than mere regulatory obligation but is an instrument to take better business decisions and sustain organizational stability. A well-structured governance framework brings positive results to companies and results in substantial profits and market success.

Interplay Between DG and CG

An notable finding in this study is that DG is linked with CG. DG enables CG by providing the structural, trustful and ethical basis for managing data and its accuracy, as information is shared with customers and regulators and by also enhancing CG to achieve transparency and accountability of decisions shaped by insights.

The CG structure of companies is put in a way to enable them to implement robust policies related to DG. When these two governance dimensions are aligned, a culture of compliance and efficiency prevails, and organizations can be proactive

regulatory happenings and market factors. Additionally, organizations that are more likely to manage and govern data as an integrated approach, as opposed to separate functions, will have optimized their resources, risks, and benefits better.

6.2 Implications

Analyzing how data and CG work together can help organizations perform better. Basis this study, it is found that organizations wanting to improve their performance will need integrated frameworks of corporate and DG to work in tandem. That means having clear policies, roles, accountabilities, and standards. Doing this could help them follow regulations more easily and also build trust with customers and shareholders. This also helps reduce risk, especially when it comes to using AI responsibly and protecting the privacy of customers. If the governance mechanisms are organized well, companies are more likely to make better choices and avoid costly mistakes.

What the study shows is that CG has a lever in shaping how data is managed within organizations. It's not just about setting data policies, but more like creating guidance and boundaries so employees know what's okay and what's not in creating, managing, and deleting data. Governance works best when it's not considered an overhead but baked into how the organization runs things day to day. People in leadership roles like board members, compliance officers, and executives can influence budgetary decisions when it comes to data security, AI tools, and artificial intelligence, which can impact the organizational outcomes. And if certain risks were to manifest like a breach or misuse, it can hurt how the shareholders perceive the reputation and maybe even result in fines or just people not trusting the brand anymore.

This is also guidance to oversight bodies and policy architects to develop complete guidance and rules on governing data holistically in a competitive ecosystem. For example, digital finance needs improved regulatory structures because artificial

intelligence generates new types of risks, such as privacy protection and cybersecurity threats. The study offers guiding principles to authorities to allow them to develop rules motivating financial institutions to practice DG principles in operations, but also to maintain respect for regulatory mandates and ethical boundaries. Such measures can lead to the evolution of a more resilient financial system as technology adoption evolves among customers.

The research establishes that business leaders, along with the CXOs, must establish DG initiatives that can cascade the benefits of managing data to organizational business goals. As organizations embed DG within their digital transformation framework, an aggressive business structure that becomes more competitive can be built.

6.3 Recommendations for Future Research

Subsequent suggestions made to researchers in the future based on this study's findings:

1. **Longitudinal Studies on Governance Impact:** Future investigations need to study how data and CG influence long-term performance outcomes using financial metrics. They will also have to ensure conformity with regulations and handle risks. A long-term research design with extended follow-up would enable researchers to track governance changes as the environment evolves along with technology and adoption, and benchmark successfully implemented principles and techniques.
2. **Comparative Analysis Across Sectoral Models:** Organizations must assess their internal governance structure between sectoral models like retail banks and neobanks alongside fintech firms or corporate banks. The study of different banking model governance systems produces knowledge on regulatory adjustments along with technological adaptations to governance systems.

3. **Role of Emerging Technologies:** The research must figure out what are the ways of enhancing governance practices through AI alongside blockchain and big data analytics. Future investigations should evaluate governance systems to see how much they can ensure compliance by reducing the risks such as financial risk and enable decision-making within ethical constraints and regulatory limits.
4. **Governance and Customer Trust:** An examination of how organizations foster trust in customers' perception and the loyalty levels of the consumer about the maturity of governance would be a good piece of work. Surveys and narrowed behaviours help build insights on what emerges when users are exposed to transparency and data defence measures.
5. **Integration of Environmental, Social, and Governance (ESG) Principles:** Increasing demand for sustainability requires research to assess how organizations bring ESG principles into their governance. To provide transparency of public investment confidence metrics and company responsibility, the relationship between operational sustainability programs and governance requirements is also addressed.

6.4 Conclusion

The research examined how DG relates to CG systems and their shared influence on organizational results. The findings confirm that DG becomes essential for organizational effectiveness through its role in managing data organization and adhering to regulations while enabling strategic choices. Those organizations that have created robust DG structures show better operational efficiency, better risk management capabilities as well as competitive advantage.

CG mechanisms that are implemented are positively related to OP to establish accountable ethical leadership and organizational transparency. Sustainability

programmes and stakeholder trust are executed by strong CG, driving enduring stability; however, DG effects may be more conspicuous compared to CG. The principal finding is that DG is a system that is interdependent with CG. Organizations with a robust CG system are usually going to be developing effective DG practices that drive a compliant and data driven culture as well as achieve operational excellence. Interdependence indicates that businesses have to consolidate their governance policies rather than treat them as independent parts.

If CG and DG strategies are in sync with each other and work independently, organizational success is much stronger. Governing in synchrony enables organizations to achieve better results through stronger, meetings, regulatory requirements, and strategic flexibility. The results of this research show that organizations should integrate their DG with CG in order to reach their highest performance levels. Governance should be recognized as the set of standards that go beyond mere legal requirements and that need to be addressed to achieve sustainable business growth and operational efficiency.

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APPENDIX A:

DATASET

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1	Age	Gender	Education	Years of E	Current P	Departme	Please Sp	Please inc	Please inc	In your ob	Please list	The roles	How effe	How effe	Our organ	Has your c	Please inc	Please ev	Please sp	Are the rc
2	1	1	2	1	1	3	1	5	1	2	1	5	4	3	4	1	3	5	3	1
3	2	2	1	1	5	9	2	1	2	3	3	4	4	5	4	1	5	3	2	2
4	3	2	3	5	5	9	3	4	3	2	3	3	4	3	5	2	5	2	4	2
5	3	2	4	3	3	6	4	2	7	2	5	3	4	5	4	2	3	5	4	1
6	4	1	3	5	4	4	5	4	8	2	2	4	3	5	3	1	5	4	4	2
7	2	1	2	2	4	5	6	4	5	4	3	3	4	5	3	1	2	4	3	2
8	3	2	4	4	5	4	7	5	5	4	3	2	4	3	5	1	3	4	3	1
9	2	2	2	1	1	1	8	1	3	3	4	4	3	5	3	2	5	3	2	2
10	2	1	2	3	4	5	9	5	3	5	4	2	3	4	5	1	5	4	5	2
11	2	1	3	2	2	2	10	1	2	2	5	5	4	3	3	1	3	5	3	1
12	3	2	2	1	2	3	1	5	4	4	4	3	4	5	2	1	5	2	3	2
13	3	2	3	5	5	8	2	1	5	3	4	4	3	5	4	2	3	5	2	1
14	3	2	3	3	4	5	3	1	4	3	4	2	4	5	4	2	3	4	2	1
15	4	1	3	3	1	3	4	4	4	3	3	3	5	4	2	1	2	5	5	1
16	4	1	4	4	3	7	5	4	6	4	2	2	3	4	5	1	3	4	4	2
17	3	2	3	2	2	3	2	2	4	4	4	2	4	3	5	2	3	4	3	2
18	2	2	2	2	3	2	7	3	4	4	3	3	4	5	3	1	5	4	3	1
19	3	1	3	2	4	5	8	4	6	3	5	3	4	5	4	1	2	3	2	1
20	4	2	3	2	2	5	10	5	4	3	4	3	4	5	5	1	3	4	3	1
21	4	2	3	4	3	3	9	2	6	3	4	4	3	2	5	1	4	2	4	1
22	3	2	3	2	3	4	6	4	6	4	3	4	3	4	5	1	3	5	4	2

U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ
Please ass	Please sel	Please inc	Please inc	How frequ	How woul	How diver	Which of t	Please rat	How effici	How satis	How enga	How woul	How woul	How effec	How comn
4	3	2	3	4	5	3	2	2	1	3	3	5	4	3	5
4	2	3	3	4	2	3	2	2	3	2	3	5	3	5	2
3	4	2	2	4	5	3	3	2	3	5	4	3	5	3	4
3	3	2	3	2	5	4	2	3	4	3	5	3	4	2	4
4	2	3	3	4	3	5	2	2	5	3	4	2	3	4	5
2	4	4	5	5	2	4	3	2	3	4	2	3	5	3	5
3	4	3	5	3	2	4	3	1	3	2	5	4	3	5	3
3	3	3	4	3	5	3	3	3	4	2	3	4	3	5	3
3	3	2	3	5	4	3	3	3	5	3	4	4	3	5	4
4	3	2	2	3	5	3	2	1	3	4	5	3	2	5	2
4	3	4	3	3	5	4	3	2	2	4	3	5	2	5	3
5	4	3	4	2	5	4	4	3	3	5	4	3	4	5	3
2	1	3	3	5	2	4	4	2	2	5	4	3	5	2	4
3	4	2	1	3	4	5	3	3	3	5	2	3	4	2	4
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3	4	2	2	3	2	4	3	2	5	3	2	4	5	4	3
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3	3	4	4	4	2	4	4	2	5	3	5	3	4	5	3
5	4	3	3	5	4	3	3	2	3	5	4	3	4	5	3