ZCAS University Press, Lusaka, Zambia, ISBN: 978-9982-29-174-3

Data Quality and Data Governance in Multinational Organisations: Insights from Zambia

[1]Chiyaba Njovu, [2]Bob Jere, [3]Dewin Arona Sikalumbi, [4]Buumba M. Dubeka

[1,2]Department of Computer Science, ZCAS University
[3]Department of Business Administration, ZCAS University
[4]Library, ZCAS University

Corresponding author: chiyaba.njovu@zcasu.edu.zm
[3]**ORCID**.org/0000-0003-2882-5517

Cite: Njovu, C., Jere, B., Sikalumbi, D. A., & Dubeka, B. M. (2025). *Data quality and data governance in multinational organisations: Insights from Zambia*. In D. A. Sikalumbi, B. Mweemba, & E. K. Bbenkele (Eds.), *Digital transformation in emerging economies* (pp. 205–226). ZCAS University Press.

Abstract

As multinational organisations increasingly rely on data-driven decision-making, the accuracy and consistency of data have become critical to operational success. This chapter examines the principles of data quality – defined as the degree to which data meets user requirements and explores its dimensions which are: accuracy, completeness, consistency, and timeliness. Effective data quality management is essential for minimising organisational risk and ensuring regulatory compliance. The chapter further investigates data governance as a strategic framework comprising policies, standards, metrics, and roles that promote consistent data stewardship. Focusing on the Zambian business environment, it argues for the localisation of global governance models to address inefficiencies and compliance challenges. The chapter offers practical recommendations for aligning data governance with Zambia's institutional realities, contributing to improved decision-making and digital transformation.

Keywords: *Data quality, Data governance, multinational organisations, data accuracy, data regulation, data governance models, Zambia*

1. Introduction

Multinational organisations use data to gain insight into the effectiveness of their operations and to capture and deploy best practices, processes, and products across global locations. Without accurate, consistent, and up-to-date data, multinational organisations cannot base decisions on real-time information, implement best practices, or understand operational results (Gimbel et al., 2017). A global business environment further complicates data quality management due to differing data convention standards and varying regulations. Data governance provides a broad,

consistent, enforceable, and auditable framework in which to operate (Siachiwena, 2014). The organisations that master these disciplines will thrive, while others, lacking reliable data and the ability to govern information assets effectively, will struggle and lose out in the new era of concurrency.

Equally, data quality and data governance are crucial to the success of organisations competing in domestic and global markets. They provide a new discipline that multinational enterprises must adopt to win in an era characterized by global, concurrent, and continuous operations and the forces of economics and time. As multinational organisations deploy and evolve their data governance coupled with data quality capabilities, the question arises whether the disciplines provide the necessary improvements to ensure success and withstood competition. To remain competitive and accelerate business performance, organisations count on measurement programs that provide meaningful, on-demand insight into core processes and critical data. Government organisations continue to fall short on operational performance and measurement programs designed at capturing core business processes and supporting data. Recent regulations such as GDPR, Personal Data Protection Act (PDPA), and the California Consumer Privacy Act (CCPA) have also pushed companies to evaluate their data management strategies.

2. Understanding Data Quality

Data quality denotes the suitability of data to fulfill a specified purpose. A fundamental concept underlying this definition is "fit for purpose," implying that data is deemed high quality if it meets a particular situational demand (Ndamase, 2014). The principal dimensions of data quality encompass accuracy, completeness, consistency, and timeliness. Accuracy gauges how closely data elements approximate their true values; consistency verifies whether data are uniformly specified throughout the system; completeness checks the extent to which data columns are fully populated; and timeliness pertains to the promptness and frequency of data updates. These dimensions bear considerable significance because regulations and policies addressing data quality issues frequently hinge upon them.

Concept of Data Quality

Data quality is a crucial aspect of data collection. Scholars, data users, and professionals recognize high-quality data as more reliable. The importance of data quality is emphasized as a primary factor that requires ongoing assessment in various data contexts. Data quality is defined as the data's relevance for its intended purpose. Various attributes determine data quality's usefulness, with accuracy, completeness, consistency, and timeliness often acknowledged as the main dimensions. Ensuring data quality not only enhances the reliability and usefulness of data but also addresses requirements imposed by various regulators.

Data governance is about controlling and managing organisational data to ensure its timeliness, completeness, and reliability. It aims to manage business data in a manner that maximizes benefit while minimizing risk. In practical terms, an organisation that governs its data effectively ensures it is complete, up to date, accurate, and consistent. Proper practices and procedures contribute to the timeliness, completeness, and reliability of information. Data governance transcends the

creation and management of policies and standards; it establishes the organisational framework for data management, encompassing the people, processes, and mechanisms necessary to oversee the formulation and integration of these policies and standards into daily business operations.

Dimensions of Data Quality

To determine the quality of data, four main dimensions have been identified. A meta-analysis by Wang and Strong (1996) of data quality dimensions listed in various articles gave four high-level categories: Intrinsic data quality, Contextual data quality, Representational data quality and Accessibility data quality (Wang and Strong, 1996).

The Intrinsic data quality category suggests that data has quality. The Contextual data quality category requires the data to be considered within a context while also recognizing that the data quality requirements will vary depending on the context. The Representational data quality category implies the data must be presented in a clear and consistent manner. Finally, the Accessibility data quality category implies the data must be available and accessible.

Importance of Data Quality

Data quality improvements lead directly to better decisions and better organisational performance (Redman, 1998). Understanding the quality of information used for decision-making allows organisations to assess risks and determine the dependency that can be placed on their outputs. Organisations also recognize that sloppy data management can result in the company having information known to be poor, leading to a culture of distrust. Discovered inaccuracies reduce user confidence and awareness of data quality, resulting in an unwillingness to use the information, regardless of source.

Poor data management can hinder compliance with regulations and legislation such as FDA rules for drug tests in the pharmaceutical industry, HIPAA requirements for securing personal health information, Sarbanes-Oxley controls for managing financial records, and Water Act regulations for water companies. Violations of these can result in strict penalties and fines. These insights reflect the aspects of data quality discussed previously: accuracy, completeness, consistency, and timeliness.

3. Data Governance Framework

Data governance is defined as the management processes ensuring formal decision rights and accountabilities for data-related processes, executed according to agreed-upon models that describe the specification, oversight, and enforcement of data policies and standards (Nadal et al., 2022). Common data governance models incorporate policies, processes, roles and responsibilities, and monitoring tools. Although technical, operational, and organisational frameworks differ, every organisation passes through comparable steps when establishing a data governance programme. Generally, a data governance system includes processes and practices defining roles, responsibilities, and controls with the objective of obtaining clear, trustworthy, and consistent data utilized throughout the enterprise (Ndamase, 2014).

A robust dataset supports organisational efficiency by enabling timely and appropriate decision-making. Reliable, high-quality datasets promote business growth and enhance employee morale, whereas poor-quality data impedes a competitive stance and deteriorates the work environment. The relevance of data quality and governance varies by organisational and environmental context, yet it remains critical for multinational enterprises operating in Zambia, a country with scarce research on these topics but increasing interest (Siachiwena, 2014).

The Concept of Data Governance

Data governance is the exercise of decision-making and authority for data-related matters, aiming to ensure effective data management and usage in alignment with enterprise strategies. Decisions include defining data principles that connect data assets with business requirements, and determining the locus of accountability, or who holds decision rights in specific situations. Establishing data governance necessitates the involvement of diverse stakeholders, including domain experts representing business users and IT designers responsible for implementing the governance framework (Nadal et al., 2022).

Operationalizing data governance requires a comprehensive understanding of the data landscape across the organisation, encompassing the taxonomies and ontologies that define the data's structure and relationships, as well as metadata that describes the provenance and transformations of data assets throughout their lifecycle. This knowledge facilitates the integration and transformation of heterogeneous data sources, the identification of pertinent information for business processes, and the interpretation of business intelligence results.

Components of Data Governance

Data Governance is the specification of decision rights and an accountability framework to encourage desirable behaviour in the valuation, creation, storage, use, archival, and deletion of information (Ndamase, 2014). Effective data governance exists when the right to take a particular decision regarding data is clearly defined, the appropriate person is instructed to do so and will do so and when there is accountability reinforcing compliance with the decision.

Data Governance encompasses several components, including the following:

(1) A clearly communicated set of policies and processes for managing data assets, including principles, practices, roles, standards and metrics.

(2) A well-designed organisational structure of well-defined roles and responsibilities.

(3) A collection of effective decision-making rights and accountabilities.

(4) A high-quality data culture.

(5) A set of readily accessible and widely understood definitions of important data.

(6) A disciplined approach to managing data-related decisions.

These components are sometimes considered alongside either three or seven major process areas that provide a comprehensive coverage of most issues involved in data governance. The triple-A Process Framework is one example that covers most of the same topics, but groups activities into wider buckets; it describes the four main processes that data governance efforts must address to achieve success:

1) Assessment – determining the scope of governance and measuring maturity (using models such as Data Management Maturity (DMM) or Capability Maturity Model Integration (CMMI) to understand the current state and desired future state);
(2) Alignment – driving consensus among stakeholders and securing time and resources;
(3) Authorization – officially empowering the data governance organisation with formal charters; and
(4) Accountability – ongoing measurement, monitoring and demonstration of compliance to sponsors.

Data Governance Models

Data governance is "the set of processes that ensures that important data assets are formally managed throughout an enterprise" (Ndamase, 2014). Components of data governance include formal policy management, operational standards and procedures, control of mechanisms, and defined roles, responsibilities, and decision rights. Different models for data governance are available. Organisations may adopt a centralized model, a decentralized model, or a hybrid of the two. The choice of a data governance model depends on the organisation's structure, preferences, and objectives. Regardless of the model, the data governance framework addresses the same primary dimensions of data: accuracy, completeness, consistency, and timeliness (Siachiwena, 2014; Sikalumbi, 2023).

4. Regulatory Environment in Zambia

Zambia's regulatory environment comprises several laws and policies that influence data quality and governance (Lee et al., 2023). The Public Order Act, the Freedom of Information Act, the Data Protection Act, the Electronic Communications and Transactions Act, the Citizens Economic Empowerment Act, the Interception of Communications Act, the Penal Code, the Reproductive Health Rights Act, and the Zambia Statistics Act constitute the main legislative framework (Siachiwena, 2014). Protocols governing data collection, processing, and storage are specified by the following government agencies: the Ministry of National Development Planning (MNDP), the Central Statistics Office (CSO), the Ministry of Justice (MOJ), the Ministry of Local Government, the Anti-Corruption Commission (ACC), the Zambia Revenue Authority (ZRA), the Police Service, and the Home Affairs Department. Data handling at the national level is therefore subject to a multitude of public authorities, in addition to the regulations imposed at sector level.

Overview of Data Regulations

Data regulations comprise a body of associated information system requirements that define security and privacy controls for electronic data. Typically, such regulations are promulgated by governmental organisations, with the objectives of ensuring an adequate level of protection of sensitive data or enhancing the confidence of organisations in adopting electronic systems. Regulations exist in various domains, such as e-Commerce, healthcare, finance and national security, addressing needs specific to the domain. Regulations impose a fusion of both functional

and non-functional requirements on Electronic Data Management (EDM) systems, which respectively ensure that the security and privacy guarantees are enforced, and that the performance objectives such as response time and availability can meet the operational needs of a company. Although these requirements should be enforced on a company's entire information system, data regulations primarily control EMC, since it is generally throughout data communication that sensitive information is most vulnerable to attacks. Stricter regulations limiting access to sensitive data typically indicate that companies require more effective EDM systems, and stricter data-management regimes. In addition, many data regulations of various industries have adopted a common set of security principles. HIPAA, for instance, applies Basel II directives to cover healthcare transactions that involve sensitive financial information (Ndamase, 2014). To comply with multiple regulations, therefore, organisations need to combine the stipulations of the applicable regulations as the starting point for a data-management strategy, and they should look for solutions that not only meet their immediate requirements but can also be extended to future needs. Such regulatory evolution must be considered in the design of any strategy for EDM. Because these organisations handle electronic data from many sources, they might be subject to different sets of regulations, which tend to evolve towards more restrictive policies. Maintaining compliance throughout the organisations implies an increase in the available data management capacity (e.g., data flow, throughputs, transmission rates).

Impact of Regulations on Data Quality

Data quality determines how data are used and treated. The overall quality of the data collected affects how useful and accurate the conclusions drawn from that data are. Having low-quality data may result in incorrect conclusions, which can negatively impact the entire decision-making process. Various governments and sectors have implemented policies and regulations regarding data protection and management to ensure data accuracy, confidentiality, completeness, and availability, thereby addressing the risk of poor-quality data.

Poor-quality data lack business value and trustworthiness, leading to difficulties in making correct business decisions and negatively impacting planning. Without effective data quality management, businesses risk making poor decisions that can cost money, customers, and the reputation of the organisation. Many organisations, particularly banks, have attempted to identify good data quality techniques and improvement strategies to support their information systems and comply with government regulations, thereby addressing policy-related challenges.

5. Challenges in Data Quality Management

It is well documented that managing data without a clearly defined data governance framework impairs the quality of the data, making it inconsistent, inaccurate, duplicate, incomplete, unreliable and untimely and therefore making data prone to become erroneous. The measurements and values of data quality management issues in the organisations housed in Zambia are consistent with the challenges previously enumerated. These challenges are also common to many organisations situated in developing countries. An empirical study on the impact of country culture on data quality found that a country's culture had a direct influence on

the data quality levels of the organisation. The Zambian business environment adds a cultural element, which exacerbates the challenge of data.

Common Data Quality Issues

Organisations in Zambia have recognised the importance of data quality nevertheless, they continue to face challenges in managing and sustaining it. Common issues such as data inconsistency, errors and incompleteness, lack of integration across systems and a lack of understanding of the relevance of poor data quality language all contribute to barriers in alleviating data quality problems. Studies have proposed data quality assessment models designed to identify underlying factors contributing to poor data quality, especially in non-Manufacturing Industry Service Limit Organisations (NISLOs). Utilizing these models facilitates the identification and analysis of root causes of data quality issues, enabling targeted investigations within chosen organisations. Implementing recommended changes assists organisations in enhancing the integrity of their databases, consequently supporting decision-making processes.

Data quality encompasses the degree of data fitness, ensuring suitability for intended use. Distinct but related to information quality, it is generally evaluated through four main dimensions: accuracy, completeness, consistency and timeliness. These attributes serve as primary quality metrics for most datasets. Research adopts operational definitions, perceiving the value of High Data Quality as a fundamental enabler across economic sectors. High-quality data also ensures proper employment of information endowment assets, distinguishing between Micro, Small and Medium Scale Enterprises within the Zambian business environment. The overarching premise posits that organisations thrive on High Data Quality for informed and effective decision-making.

Cultural Factors Affecting Data Quality

The importance of managing data quality effectively cannot be overstated. How successful an organisation is at managing, providing and using good quality data will have an influence on the quality of decisions, products, services and benefits derived. Evidence suggests many organisations do not prioritise data quality or have a strategy and framework to manage and govern data quality. Organisations often point to budget, time and resource constraints as the key reasons for their lack of adequate investment and management of data quality. However, cultural factors are rarely identified.

Good regulatory data is imperative, highly complex and inevitably costly to produce. Banks have no choice but to address these challenges; their business model is built on reputation and trust. Poor quality data leads to poor decision-making and an increased risk of regulatory non-compliance. Nowadays, data quality issues originate from many sources – ranging from poor decisions and badly equipped staff through to regulatory and legal constraints. Multinational organisations have recognised these challenges but appear to be struggling to identify the solution and implementation route to a credible and solid data quality framework in their business.

6. Strategies for Improving Data Quality

While the importance of data quality is broadly recognized, the practical aspects of achieving it frequently pose a challenge. Concrete strategies and examples can therefore aid managers and information workers. Data quality can be viewed from two distinct perspectives: managing a data resource and managing the inherent quality of data as a corporate product. The first perspective suggests a proactive approach to data quality—establishing practices that prevent the entry of junk data into a system and constructing systems capable of enduring poor-quality data. The second perspective is represented by techniques for assessing and cleansing data once it has been acquired.

From the service perspective, Appelbaum and Haley (1998) observe, "The managers' role is to ensure the quality of the information that is provided to users, including vigilant oversight of the development, monitoring and review of information systems." Chapple and Barker (1997) add that "data relationships need to be monitored regularly." A data service strategy is intended to produce fit-for-use data, yet culture remains the principal barrier to data quality. Ross et al. (2006) comment, "Despite the logical, operational and economic benefits of assuring the accuracy and consistency of data, we do not observe many companies that have taken such a position. The main constraints that have prevented companies from implementing such a program are cultural in nature.

Data Quality Assessment Techniques

Data quality is defined as the measure that determines how well data attributes represent reality or the condition being examined. It reflects the condition of a set of values of qualitative or quantitative variables. High data quality ensures that the data is fit for its intended uses in operations, decision-making, and planning. When data does not meet users' expectations or requirements, it is considered defective, which leads to reduced benefits, increased costs, and exposure to business risks. Data can be flawed in aspects such as accuracy, completeness, consistency, or timeliness. In the Zambian data quality landscape, these four dimensions emerge as the most critical factors in judging the acceptability of a data set for various uses.

Due to its significance, data quality plays an important role in both financial records and supporting data required by regulatory bodies. For example, businesses provide various performance records to regulatory agencies, such as SARS. Falsification of data affects different government departments, leading to financial penalties. Specific aspects of data quality assessment include usability, accuracy, completeness, integrity, consistency, validity, and timeliness. Problems may arise from typing errors during data capture, especially when each department determines its own data format. Such errors could be avoided or mitigated through the adoption of standardized policies.

Data Cleansing Methods

Data cleansing methods play a pivotal role in correcting data inconsistencies and improving data quality. Initially, after assessment, organisations select one or more of these methods to enhance data quality based on their data quality and data governance objectives.

One approach centers on addressing data entry mistakes, such as incorrect spellings and missing values. Examples include: - Validating data against standard dictionaries - Utilizing postal code databases for addresses - Detecting duplicate records - Fill-in techniques for missing attributes (e.g., interpolation, mean imputation) - Conducting outlier tests to identify and rectify anomalous values. Another approach involves auditing data based on business rules.

7. Role of Technology in Data Governance

The objective of data governance is to achieve a single version of the truth and to establish a single reference for critical master data across geographies and business units. Multinational companies employ data governance to support their management teams in controlling data quality. The value of any technological innovation is measured by its adoption, acceptance, and sustainability. Although technological innovations in Zambia are significant, poor adoption, usage, and sustainability challenge data governance and national economic growth. Data governance is ICT-driven and is meaningful only when aligned with ICT policies, rules, goals, and values in a sustainable manner (C. Aguboshim et al., 2019).

An effective data governance strategy incorporates the appropriate technology that supports the framework without undermining quality. Technologies such as database management systems, e-mail, spreadsheets, Business Intelligence technologies and tools, Master Data Management Solutions and Architectures, Analytical Platforms and Architectures, and Frameworks for Event Processing aid in the implementation of data governance. Emerging technologies like cognitive computing, artificial intelligence, and the Internet of Things can automate previously manual data governance activities, enabling organisations to manage data more effectively. The scale of current data generation requires rapid solutions to many data governance tasks. A comprehensive approach that includes the development of data governance maturity models can guide organisations toward successful implementations and improvements (Ndamase, 2014).

Data Governance Tools

Data governance tools are software packages that support the design and enforcement of data policies, typically through web-based interfaces. They provide rule-definition facilities for various types of policies such as access, disclosure, retention, and electronic records management—and for validation-check and transformation-specification frameworks. Customizable interfaces enable principal users to apply the rules to repositories; automated evaluation facilities support systematic reviews of impacts of a potential new policy and of existing policies after their implementation. Most tools adopt a lightweight view to integrate within data ecosystems, interfacing to a limited set of existing systems. Automated discovery of application program interfaces (APIs) for the production and consumption of data is becoming common, typically browsing source-code libraries to yield machine-readable lists of supported operations; intelligent support for policy reconstruction within the data ecosystem, including assistance with replication, transformation, master-referential and drift-related rules, is rarely attempted. Document repositories are seldom reviewed from a governance perspective, despite their frequent role as originators of unstructured and semi structured data. Emerging

technologies such as graph, geo-spatial, and streaming platforms generate a need for comprehensive and adaptive data governance support.

Emerging Technologies in Data Management

Multinational organisations in Zambia face ongoing challenges related to data quality and data governance, particularly while integrating emerging technologies. Such technologies enable large-scale data collection, analysis, and improved decision-making, but also bring new complications. For example, distributed ledger technology offers cost benefits to mining firms that rely on fast-moving transaction data yet requires high data quality and consistent governance in a challenging Zambian business environment (Ndamase, 2014).

Data governance encompasses the practices and standards that regulate data management and organisation. A sound framework establishes procedures to uphold information quality and the strategic use of data within targeted processes. These frameworks are implemented through supporting structures that define policies, assign responsibilities, and maintain standards. Data governance serves as the overarching mechanism for delivering trustworthy data, with governance solutions reducing complexity and best-practice programs guiding the adoption of quality-enhancing technologies.

8. Case Studies of Multinational Organisations

In the Zambian business environment, multiple multinational organisations from both the private and public sectors continue to promote various forms of data governance to enhance data quality. Studies on corporate major events reveal a plethora of information subject to data quality management in African organisations, including extensive data on mergers and acquisitions, market performance indicators, and political environments. However, the management of this data is often hindered by the absence of comprehensive data governance frameworks (Siachiwena, 2014). The cumulative effect of weak data governance practices results in inconsistencies and inaccuracies that impede decision-making processes.

Successful Data Governance Implementations

Multinational companies are being faced with increased competition since they have expanded their operations beyond national borders. The Zambian market has many opportunities, which foreign investors have taken advantage of and started operating in the country. Managing data plays an integral role in any multinational company management because foreign multinationals bring with them lots of data due to the various challenges encountered in the market. Data quality and data governance are therefore important in ensuring correct decision-making. The quality of data available for decision-making needs to be of a high standard to realize the organisational goals of a multinational company (Mutale et al., 2013).

Data governance considers strategic decision rights and accountability to encourage desirable behaviours within the valuation, creation, consumption and control of data and information (Gimbel et al., 2017). Multinational companies mostly make decisions from data collected; therefore, sustainable data governance delivers strategy, security and value for data and information assets. Data governance combines ownership, accountability and value of data and

conveys the management of the overall integrity of the organisational data. It effectively assists all corporations to focus on controls and quality that assists with the short land of time and associated cost.

Visa Inc. successfully implemented data governance through consistent and up-to-date data consolidated from multiple systems into a standard database source. Vodafone carried out its initiative in a very structured way, with clear milestones and benefit tracking; a single tool was used across the entire programme. Tesco recognised that implementing data governance after the data quality improvement programme was not effective. The business made good use of specialists in the early stages of implementation, with business champions providing expertise during later stages. Kellogg extended its data governance initiative further than the space and timeframe of the original project. The need for continual data-quality improvement indicates a company is taking its data governance seriously.

Appropriate action can be taken once the verification of these concerns has been made. Data quality is a business-wide imperative for all multinational companies. A strategic approach to data quality is therefore imperative.

Lessons Learned from Failures

Organisational failures offer valuable opportunities to learn, yet they remain difficult to study because most organisations hide their failures while they tend to share their successes or at least keep them visible only to a limited audience. At the organisational level, failures of the past and future incidents cause losses of significant shares of market capitalization. Following failure, organisations can face an increased legal risk and uncompetitive positions in the marketplace; teams and employees can become demotivated; memories of failures can block future knowledge creation; and losses in reputation can negatively impact these outcomes. As a result, organisations learn more from their successes than from their failures, seemingly paradoxical, given the obvious potential for improvement presented by failure events. Companies such as Schlumberger or the German Savings Banks have been able to improve their performances through the examination of failure events and the study of the recovery strategies that were successfully applied. A similar outcome was found in professional service firms during merger failure transitions. Unfortunately, many other failures teach little while disastrous events remain a perennial feature of the environment. Under certain circumstances, individuals exposed to failure can develop fatalistic attitudes and decide to give up, either on the task or on an entire company or industry. Other factors limiting the potential for learning include the loss of visibility of failure, the fear of social sanctions, the inability to interpret what went wrong, or the lack of available alternatives to circumvent the problems encountered.

9. Impact of Data Quality on Business Performance

Multinational organisations operating in Zambia strive to provide stakeholders with accurate data that informs business decisions. Data quality is a multi-dimensional concept commonly defined with respect to four dimensions: accuracy (correct and reliable data), completeness (all necessary data are present), consistency (uniformity of data across systems and over time), and

timeliness (data are current and available when needed), (Anstiss, 2012). However, organisations encounter significant difficulties in meeting these data quality requirements within the Zambian business environment. The presence of databases riddled with inaccuracies and inconsistencies results in erroneous conclusions that often lead to substantial losses for various companies. Even though efforts are made to address data quality problems, many challenges remain (Ndamase, 2014).

Relationship Between Data Quality and Decision Making

Data quality encompasses several dimensions of equal importance in a business context: accuracy, completeness, consistency, and timeliness. Accuracy involves correctly representing an entity of interest, whereas completeness pertains to the extent to which the available data meets the required purpose. Consistency requires that data are equally defined and hold the same value when presented in different instances, and timeliness refers to data being available within an acceptable timeframe. The first two dimensions—accuracy and completeness—are particularly critical when preparing regulatory data or managing trade data processes that depend on scheduled flows to meet quality levels (Ndamase, 2014).

Data quality underpins the efficient functioning of a company, and the 2008 financial crisis highlighted the critical impact of data-related errors and risks on businesses and economies. Attaining the expected performance and benefits of investments becomes challenging in the presence of poor-quality data. When soiled data underpins daily operational decisions, business processes cannot respond effectively to market requirements.

Case Examples of Performance Improvement

Multinational organisations operating in Zambia are confronted with new and unique dimensions of previously familiar problems of performance improvement when attempting to implement data management frameworks that will comply with the legal restrictions in place on data (Lee et al., 2023). While it has been possible to learn from the experiences of organisations based in other localities, any application of multinational, multi-locality corporate solutions proceed only in close consultation with local staff to adapt the general form of the program to a specific business environment. The overall objective of a program in a new environment remains a broadly addressed and generalized goal of improved performance on a particular issue. Corporate data-quality governance initiatives implemented by multinational, multi-locality organisations in Zambia illustrate the problems directly in terms of corporate objectives while demonstrating the critical importance of a local adaptation process. The empirical characterization of the relationship between the overall objective and the local, contextual implementation of a program is the principal objective of the study because it delivers one solution to the broader issue of improving cross-country program assessment.

10. Future Trends in Data Governance

Technology enables data governance through architecture, data platforms, metadata management, master data management, data quality, data profiling, and data lineage. Emerging

technologies—predictive analytics, data mining, enterprise awareness, and artificial intelligence—are expected to facilitate enhanced, potentially automated data governance. This development pathway leads toward more consistent, reliable, and complete information as outputs of a well-defined data governance program and underlines data quality as a key factor in the success of governance initiatives (Ndamase, 2014). Businesses aiming to improve internal processes and reduce operational costs rely on data systems to develop and maintain competitive advantage, indicating that data governance is a critical element of corporate management (Siachiwena, 2014).

Predictive Analytics and Data Quality

Predictive analytics harnesses data-analytics and computer-learning techniques to derive actionable forecasts from historical trends and current data. The goal is to model future outcomes, opportunities, or threats. As multinational companies increasingly adopt predictive analytics, the importance of the underlying data quality grows commensurately. Poor data quality will manifest as poor outcomes, ultimately damaging the analytic process (Ndamase, 2014).

Data quality characterizes the utility of a data asset in support of a specific task or context. The system of tasks and the associated context collectively form the use case; the measure of fitness establishes whether a source provides adequately high-quality data, and—after any necessary enhancement—whether the analysis can proceed or the source must be abandoned. Assessment of data quality thus delivers a binary pass/fail verdict in response to a particular use case.

Data-quality literature identifies four principal quality dimensions: accuracy, completeness, consistency, and timeliness. Accuracy concerns numeric data, checkpointing, and spelling, as well as semantic consistency and object dependencies. Completeness denotes the presence of the full cohort of expected data items and elements; consistency indicates that data are the same in all sources and instances; and timeliness stipulates that data must be both current and stored within a relevant time span.

Within multinational contexts, multiple source environments arise from political and cultural heterogeneity, resulting in a proliferation of data-quality problems and raising the stakes of assessment. Industries such as pharmaceuticals and aerospace deploy predictive analytics widely; further, many of the world's largest multinationals reside in Portugal, Holland, and Belgium. From this perspective, the analysis of multinational data-quality problems extends naturally to an exploration of their data-governance practices.

The Role of Artificial Intelligence

Artificial Intelligence (AI) emerges as a powerful technology supporting data governance, offering insights beyond traditional statistical tools used in data quality management (Nadal et al., 2022). While advanced technology aids the governability of data governance frameworks, AI-based systems significantly extend these capabilities to address diverse societal needs across various domains (Schneider et al., 2020). Initially conceptualized in the 20th century, AI refers to systems that mimic human intelligence by analyzing information and making decisions autonomously. Its versatility enables support for control, measurement, classification,

monitoring, and governance in virtually any context. When integrated into governance practices, AI enhances overall effectiveness by supporting predictive analytics that proactively identify potential risks and provide timely alerts to governance and control actors. Still reliant on additional technological research to meet emerging requirements, AI has the potential to be a critical asset in multinational organisations operating in Zambia, particularly in data governance.

11. Best Practices for Data Governance

Studies examining Zambian governance illustrate its critical role in economic growth, social advancement and development (Mutale et al., 2013). Achievement of international development goals is partly contingent on governance practices. Governance has been linked to numerous facets of national development, including economic growth, social advancement, security, stability and overall progress. Governance provisions also have a direct influence on the achievement of Millennium Development Goals. Governments failing to meet the developmental aspirations of their constituencies are labeled as ungoverned or poorly governed. Development and validation of a governance measurement tool for rural health facilities in Zambia identified a set of governance statements addressing clinical tasks, administrative demands, contextual constraints, and patient-related behaviours. This exercise generated a set of positive governance statements with high internal consistency that serve as a useful proxy for assessing governance practices at the primary care level.

Establishing a Data Governance Council

As multinational organisations strive to embed data governance practices within their operations, the data quality challenges that resulted in inefficient data management can be conveniently overcome by establishing a data governance council to effectively direct their data governance initiatives (Ndamase, 2014). The first and most critical step in establishing solid data governance practices is to set up a formal data governance council. This option is the starting point because the organisation's data management challenges are generally common across the board, and the formation of a data governance council provides an opportunity for the organisation to properly address these challenges by putting control mechanisms in place. The data governance council is responsible for determining the life cycle of an organisation's data by defining what data to retain or purge, the guidelines and procedures around data collection and storage, and managing the quality, security, consistent use, and integration of the organisation's data. A data governance council that is positioned appropriately and staffed with knowledgeable and passionate members can become a great asset for the organisation.

Creating a Data Quality Culture

Establishing a data quality culture is a strategic initiative that helps anchor the governance structure and the organisation at large. Its foundation lies in clearly defined definitions of quality, so that everyone understands when data can be considered fit for use. The initial phase consists in communicating monitoring results to the wider corporate community, leveraging media such as e-mail, dashboards, or meetings to reinforce the message consistently. The approach may

involve categorizing data values using the stoplight metaphor: values flagged red fail to meet agreed standards, yellow indicates threshold or attention levels, and green means data that fulfill the required standards. Disseminating these indicators regularly makes them familiar and integrates data quality awareness into everyday business conversations and decision-making processes.

12. Conclusion

The proliferation of information systems driven by technological advancement has resulted in an unprecedented accumulation of data, bringing with it a plethora of data quality and management issues (Siachiwena, 2014). The resultant cost to organisations underscores the critical importance of Data Quality and Data Governance, particularly for multinational organisations operating in Zambia, where data is considered an invaluable asset. This study, therefore, investigates Data Quality and Data Governance in the context of the Zambian business environment. Utilizing a qualitative approach, the research examines how multinationals align their practices with national data protection legislation. It also explores a range of Data Governance initiatives adopted to enhance organisational growth and performance. The findings indicate that comprehensive adoption of Data Governance principles correlates positively with sustainable growth and efficient information resource management, thereby enhancing the likelihood of organisational success.

References

Anstiss, S. (2012). Understanding data quality issues in dynamic organisational environments – a literature review. https://aisel.aisnet.org/acis2012/35/

C. Aguboshim, F., N. Ezeasomba, I., & E. Ezeife, J. (2019). Sustainable Information and Communication Technology (ICT) for Sustainable Data Governance in Nigeria: A Narrative Review. DOI: 10.7176/JIEA/9-5-02

Gimbel, S., Mwanza, M., Paul Nisingizwe, M., Michel, C., Hirschhorn, L., & PHIT Partnership Collaborative, A. H. I. (2017). Improving data quality across 3 sub-Saharan African countries using the Consolidated Framework for Implementation Research (CFIR): results from the African Health Initiative. DOI: https://doi.org/10.1186/s12913-017-2660-y

Lee, N. M., Singini, D., R Janes, C., A Grépin, K., & A Liu, J. (2023). Identifying barriers to the production and use of routine health information in Western Province, Zambia. ncbi.nlm.nih.gov

Mutale, W., Tembo Mwanamwenge, M., Balabanova, D., Spicer, N., & Ayles, H. (2013). Measuring governance at health facility level: developing and validation of simple governance tool in Zambia. ncbi.nlm.nih.gov

Nadal, S., Jovanovic, P., Bilalli, B., & Romero, O. (2022). Operationalizing and automating Data Governance. ncbi.nlm.nih.gov

Ndamase, Z. (2014). *The impact of data governance on corporate performance: the case of a petroleum company*. (Thesis). University of Cape Town, Faculty of Commerce, Department of Information Systems. Retrieved from http://hdl.handle.net/11427/13323

Schneider, J., Abraham, R., Meske, C., & Vom Brocke, J. (2022). Artificial Intelligence Governance for Businesses. *Information Systems Management*, *40*(3), 229–249. https://doi.org/10.1080/10580530.2022.2085825

Siachiwena, H. (2014). Governance and socioeconomic development in Zambia: an analysis of survey data and development indicators. https://open.uct.ac.za/server/api/core/bitstreams/5f3b8ac5-2988-4376-abbe-501bfd9ab32a/content

Sikalumbi Arona Dewin (2023). Success in research, the researcher's companion, Printgraphix Zambia, Lusaka.