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DATA GOVERNANCE IMPLEMENTATION IN INDONESIAN HIGHER EDUCATION: STRUCTURAL IMPACTS ON INSTITUTIONAL PERFORMANCE, DECISION-MAKING, AND DATA QUALITY

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Abstract

Data governance is essential in public universities, particularly in Indonesia, where robust data management is vital to achieving institutional objectives and improving overall performance. Although crucial, implementing robust data governance in many universities remains challenging due to the complexities of managing vast amounts of data and ensuring regulatory compliance, which often impacts operational efficiency and decision-making. This study explores the impact of data governance implementation within public universities in Indonesia. This study utilised a qualitative research approach, incorporating a case study methodology and semi-structured interviews as the primary means of data collection. Twenty-two participants in this study are policymakers and individuals responsible for the organisation's information systems and data management from eight public universities in Indonesia. This study found that data governance implementation in a public university has implications for performance, decision-making, data quality, and data security. These findings offer insights to help university management improve data governance implementation. However, the study faced limitations from online interviews, connectivity issues, and a lack of nonverbal cues. University resistance resulted in a smaller sample size, potentially affecting generalisability. Limited documentation on data governance implementation posed challenges. Future research could explore factors influencing data governance adoption and its relationship to emerging technologies such as AI and machine learning.

Keywords: *data governance, higher education policy, institutional performance, Indonesian public universities, qualitative case study, contingency theory*

INTRODUCTION

In the digital era, data has become a pivotal asset for organisations, including educational institutions. For universities, especially those in the public sector, efficiently managing and utilising data is vital for achieving institutional goals and enhancing overall performance. Public universities in Indonesia are under growing pressure to enhance their administrative and academic processes, positioning data governance as a critical component of their strategic operations. Data governance involves the frameworks, guidelines, and protocols necessary to manage data as a critical organisational asset, ensuring its reliability, accessibility, and protection (Mahanti, 2021).

The significance of data governance in public universities lies in its capacity to ensure the integrity, reliability, accessibility, and security of data assets. Governance of data is not merely about compliance; it serves as a comprehensive mechanism that influences the quality of services, the transparency of processes, and the credibility of institutional outputs. Through robust governance frameworks, universities can align their information systems with strategic objectives, improve operational efficiency, support evidence-based policy making, and safeguard sensitive information against misuse or breaches (Ladley, 2020; Otto, 2011). This is especially relevant in Indonesia, where public universities play a vital role in supporting national priorities in education, research, and innovation. The Indonesian government has set ambitious goals for higher education reform, including improved data-driven performance evaluation, research excellence, and international competitiveness (Kementerian Pendidikan dan Kebudayaan, 2020a, 2020b).

Despite the increasing relevance of data governance, many Indonesian public universities continue to struggle with its effective implementation. Several studies and institutional reports indicate that data-related initiatives are often fragmented, reactive, and hindered by bureaucratic silos (Jim & Chang, 2018;). The complexities of managing vast amounts of data—ranging from student and staff records to financial information and research data—pose significant challenges (Ladley, 2020). These challenges are exacerbated by the need to comply with government regulations and ensure data privacy and security. Universities often face challenges in establishing comprehensive data governance frameworks due to insufficient infrastructure, limited resources, and a lack of specialised expertise. Consequently, their data management practices tend to be fragmented and inefficient.

Strong data governance in Indonesian public universities can significantly improve decision-making, operational efficiency, and overall institutional performance. By maintaining high-quality data through well-structured

governance frameworks, universities can enhance student services, support informed decision-making, and drive better academic results. Moreover, as big data and predictive analytics gain prominence in higher education, the risks of data breaches and misuse increase, highlighting the urgent need for rigorous data governance practices (Borgman, 2016).

Implementing robust data governance can help universities comply with national and international data protection and privacy standards, safeguard institutional reputation, and foster stakeholder trust. For instance, adhering to data governance frameworks helps universities align with regulations such as Indonesia's Personal Data Protection Act (PDPA), which mandates strict data management and security measures.

Acknowledging the vital role of data governance in universities and the limited research on its impact, this study seeks to explore the effects of data governance implementation in Indonesian public universities. By examining the challenges and opportunities involved, it aims to identify best practices and strategies to enhance data management effectiveness in the higher education sector. The findings are expected to contribute to the broader academic discourse on data governance, providing valuable insights for policymakers, university administrators, and researchers dedicated to enhancing higher education through robust data governance frameworks.

LITERATURE REVIEW

The idea of data governance emerged from IT governance as data became recognised as a crucial organisational asset, and the complexities of managing data grew beyond the scope of traditional IT governance (Benfeldt et al., 2020; Neff et al., 2013; Nielsen, 2017). According to Weill and Ross (2004), IT governance focuses on ensuring that IT investments align with business objectives and effectively mitigate IT-related risks. As data gained recognition as a vital asset, the increasing volume and variety of data sources required a more specialised approach to governance (Al-Ruithe & Benkhelifa, 2020). This development highlighted the necessity for data governance, which provides a structured framework for efficiently managing and utilising data.

Data management encompasses the creation, execution, and monitoring of strategies, policies, programs, and practices to control, safeguard, deliver, and optimise the value of an organisation's data and information assets (Data Management Association, 2009). In contrast, a universally accepted definition of data governance remains elusive (Abraham et al., 2019). The Data Management Association defines data governance as the process of "exercising authority and control over data management" (Data Management Association, 2009, p. 19).

Alternatively, Al-Ruithe and Benkhelifa (2020) describe data governance as "the entirety of decision rights and responsibilities concerning the management of data assets in organisations" (p. 3). Consequently, data governance integrates high-level planning and oversight of data management challenges while clearly defining roles and responsibilities for action (Khatri & Brown, 2010).

Data governance encompasses governance frameworks, organisational reach, data coverage, domain scope, antecedents, and the outcomes associated with its implementation (Abraham et al., 2019). The main goals of data governance are to enhance the value of data assets and reduce data-related risks (Abraham et al., 2019). These efforts lead to improved data quality (Abraham et al., 2019), bolstered data security (Felici et al., 2013), lower data-related costs (Abraham et al., 2019), and more informed decision-making (Al-Ruithe & Benkhelifa, 2020).

Data governance has been defined as "a system of decision rights and accountabilities for information-related processes, executed according to agreed-upon models which describe who can take what actions with information, and when, under what circumstances, using what methods" (Young & McConkey, 2012, p. 70). This definition highlights the necessity of clarity and structure in managing data. By clearly establishing decision rights and responsibilities, organisations can ensure that data management aligns with business goals and meets regulatory requirements. In the context of universities, robust data governance can significantly affect operational areas such as data quality, security, decision-making, and overall institutional performance. Given that data and information are critical assets in higher education, their effective management demands a systematic and strategic approach. Data governance frameworks in universities should be customised to support both academic and administrative functions while meeting the needs of various stakeholders, including students, staff, faculty, administrators, and the research community (Jim & Chang, 2018). This study explores these potential impacts within the context of public universities.

Numerous studies have explored various aspects of data governance, including taxonomy, design, frameworks, maturity models, activities, critical success factors, research agendas, and applications in higher education (Alhassan et al., 2016, 2018, 2019; Abraham et al., 2019; Al-Ruithe & Benkhelifa, 2020; Jim & Chang, 2018; Khatri & Brown, 2010; Thomas et al., 2019). However, relatively few studies have conducted in-depth analyses that provide a comprehensive understanding of the implications of data governance implementation, particularly within the university setting (Abraham et al., 2019; Jim & Chang, 2018; Tallon et al., 2013). Previous studies have explored the effect of data governance on organisational performance (Martijn & Jonker, 2015; Neff et al., 2013), limited

attention has been given to its application in higher education institutions (Jim & Chang, 2018; Liu, 2020; Putro et al., 2016). The main goal of data governance in universities is to fulfil the needs and interests of various stakeholders, such as students, staff, faculty, administrators, and the wider research community (Jim & Chang, 2018). This underscores the importance of further research on data governance in higher education settings (Jim & Chang, 2018). To address this gap, the current study explores the data governance implementation and its implications in public universities in Indonesia.

Furthermore, there is no universal paradigm for implementing data governance, as each use case reveals specific strengths and weaknesses (Carballa Smichowski, 2019; Delacroix & Lawrence, 2019; Weber et al., 2009). Successful data governance requires alignment with the organisation's business strategy to create synergies that facilitate comprehensive implementation (Neff et al., 2013). Given the interdependence among data governance, IT governance, and corporate governance, these models can complement one another, thereby enhancing governance maturity (Neff et al., 2013). Thus, this study focuses on the effects of implementing data governance in public universities. Investigating data governance within this context can offer valuable insights into best practices for efficiently managing data in complex organisational settings. Additionally, it can help identify the challenges and barriers that must be addressed to ensure successful implementation.

Despite these valuable contributions, important gaps remain. First, most existing studies focus on conceptual frameworks, maturity models, or organisational performance at a general level, with limited attention to the practical realities of implementing data governance in higher education institutions. Second, the literature often treats universities as homogeneous entities, overlooking the distinctive challenges faced by public universities in developing countries, such as resource constraints, fragmented data infrastructures, and complex regulatory environments.

METHODOLOGY

This section describes the research design, participants, data collection techniques, and analytical approach utilised to investigate the phenomenon comprehensively. Given the study's aim to delve into the lived experiences and perspectives of essential parties in data governance, a qualitative research approach was chosen. This methodology enables a deeper understanding of the challenges, strategies, and consequences of implementing data governance across various organisational settings. The section additionally highlights the ethical considerations, data collection processes, and analysis methods that underpin the study's rigour and

validity. By adopting a qualitative approach, this study offers profound insights into the broader discussion of data governance in higher education, highlighting both its practical implications and theoretical foundations.

Research design

This research aims to enhance knowledge and understanding of data governance implementation by exploring relevant literature and lived experiences, particularly within Indonesian public universities. Instead of being viewed as less rigorous than quantitative research, qualitative research is recognised for its unique strengths and contributions (Houghton et al., 2013). A qualitative approach is employed in this study, as it is well-suited to conducting an in-depth, comprehensive exploration of the complexities of data governance. The primary aim of this study was to contribute to the current understanding of data governance, rather than to analyse interrelationships between groups or to employ statistical tools to validate hypotheses, as is characteristic of quantitative research.

This study sought to conduct an in-depth exploration of data governance implementation in Indonesia's public universities, aiming to capture and differentiate the diverse perspectives surrounding the phenomenon. The study's objective was to enable participants to derive the case's meaning from their interpretations and perceptions of the situation under investigation (Creswell, 2014). Beyond numerical measurement, qualitative research is widely employed in business studies and the social sciences to illuminate complex social and cultural phenomena (Myers & Avison, 2002; Zikmund et al., 2009). As Abraham et al. (2019) suggest, expert interviews or case studies are essential in data governance research to comprehend how the concept is implemented in real-world scenarios. Given the critical nature of the topic and the need for comprehensive analysis, a qualitative approach was deemed the most suitable methodology for this study.

Participants and data collection

The study included 22 participants from eight Indonesian public universities as shown in Table 1, guided by the saturation principle. These participants were chosen for their extensive knowledge and expertise in data governance, given their central roles in decision-making and operational processes related to its implementation. University management, encompassing top-level administrators, department heads, and other relevant personnel, is a key stakeholder in shaping data governance direction and policies. Their viewpoints are crucial for understanding the practical challenges and strategic approaches involved in its

implementation. To recruit participants, the researchers employed network channelling, utilising professional networks and personal contacts to establish communication with relevant university personnel. Once the necessary permissions were obtained, interviews were conducted to gather qualitative data on participants' capabilities and perspectives on data governance. The interviews employed open-ended, exploratory questions designed to elicit detailed responses about the challenges, successes, and strategies involved in implementing data governance. The participants consisted of three members of university management, such as vice-rectors and deans, and 19 individuals from the Information Technology and Information Systems departments, including heads and staff. These participants were selected from universities across three tiers. In Indonesia, there are three tiers (levels) of public universities, which depend on the government's management autonomy and their performance.

Table: 1 Participants Profile

Case	University	Participants	Job Role	Experiences
Case 1 (Tier 1 University)	A	1	Head of the Centre of Technology and Information Systems	3 years
	B	2	Head of Community Funding (Member of Team Information System Development)	3 years as Head of Public Fund, 11 years in IS development (Finance module)
	B	3	Secretary of the Directorate of System and Information Resources	4 years
	B	4	Head of Data Analyst	3 years
	C	5	Head of Information System, Data, and Reporting Department	2 years
	C	6	Vice Head of Information Systems, Data, and Reporting Department	6 months as a vice head, 1 year as a staff member in data and applications, 4 years as a staff member in the infrastructure network
	C	7	Supervisor of the Information system, data, and reporting Division	1 year as a supervisor,

Case	University	Participants	Job Role	Experiences
				10 years as a staff member in the IS department
	C	8	Supervisor of Network and Hardware Division	3 years as a supervisor, 11 years as a staff
Case 2 (Tier 2 University)	D	9	Head of System and Collaboration of Information and Communication Technology Technical Implementation Unit	15 years
Case 2 (Tier 2 University)	D	10	Vice Rector of Resources and Information	3 years
	D	11	Dean of Vocational School (Member of Information System Development)	3 years
	E	12	Vice Rector of Planning and Networking	2 years
	E	13	Head of Information and Communication Technology Technical Implementation Unit	4 years
	E	14	Head of Data Division of Information and Communication Technology Technical Implementation Unit	1 year as Head of Data Division, 12 years as staff in the ICT Unit
	E	15	Head of Information System Division of Information and Communication Technology Technical Implementation Unit	4 years
	E	16	Head of Information System and Application Development Division of Information and Communication Technology Technical Implementation Unit	7 years
	F	17	Head of Information and Communication Technology Technical Implementation Unit	2 years as the head, 11 years as staff.

Case	University	Participants	Job Role	Experiences
	F	18	Coordinator of the Infrastructure of Information and Communication Technology Technical Implementation Unit	6 years
	F	19	Coordinator of Analyst and Innovation of Information and Communication Technology, Technical Implementation Unit	5 years as the coordinator, 6 years as a staff
Case 3 (Tier 3 University)	G	20	Head of Information and Communication Technology Technical Implementation Unit	2 years
Case 3 (Tier 3 University)	G	21	Former Head of Information and Communication Technology Technical Implementation Unit	5 years
	H	22	Head of System and Infrastructure of Information and Communication Technology Technical Implementation Unit	3 years

This study used semi-structured interviews, guided by the contingency theory of data governance, to explore its research questions. Contingency theory provided a valuable framework for this analysis, helping to identify and categorise themes based on their contextual dependencies and the specific conditions under which they operate. This theory's application ensured that the themes were not only theoretically grounded but also practically relevant to the study's context. The interview questions covered general information, data governance, and implications, with open-ended prompts allowing participants to share detailed insights. Questions were not disclosed beforehand, ensuring spontaneous and unbiased responses. Interviews were conducted with university management and staff involved in data management, whose feedback was essential in understanding data governance challenges. The interview protocol was granted ethical approval by the University of Malaya Research Ethics Committee (UMREC) prior to data collection. The approval, referenced under the number UM.TNC2/UMREC_1490 is valid from August 2021 to August 2024.

Data collection for this study began in August 2021 and concluded in June 2022. Participants responsible for information systems at universities were identified, contacted, and interviewed online due to COVID-19 restrictions.

Informed consent was obtained via email, ensuring a streamlined, paperless process. Semi-structured interviews, ranging from 45 minutes to 1.5 hours, were conducted via platforms such as Teams, Google Meet, and WhatsApp, with audio recordings made for reference and backup. This approach aligned with ethical guidelines and leveraged digital tools for convenience and inclusivity, challenging the notion that face-to-face interviews are the gold standard in qualitative research (Saarijärvi & Bratt, 2021).

Audio recordings and transcriptions enabled detailed analysis, while relevant documents, such as university policies, provided additional context. The study's 22 interviews, mainly with information systems leaders, identified key themes and developed a research framework and recommendations. These insights will inform future data governance strategies in universities and broader organisational contexts. This approach provided valuable qualitative insights into the practical implementation and impact of data governance. The study follows the six-step guide outlined by Braun and Clarke (2006) for data analysis, which includes: (i) becoming familiar with the data, (ii) generating initial codes, (iii) searching for themes, (iv) reviewing themes, (v) defining and naming the themes, and (vi) producing the report. Given that analysis is a non-linear process, this guide is applied recursively, with the researcher revisiting various phases throughout the analysis. Further details on coding can be provided.

FINDINGS

This study indicates that data governance implementation in public universities affects key areas, including performance, decision-making processes, data quality, and data security. Through structured data management within governance frameworks, university performance can be enhanced. Participants noted that data governance plays a significant role in optimising the data required for accreditation and rankings. It also establishes a strong basis for data-driven decision-making. According to participants, access to high-quality, secure data allows university leaders to make informed decisions, thereby supporting strategic planning, resource allocation, and policy development. Effective data governance ensures the accuracy, consistency, and reliability of data. Improved data quality, as highlighted by participants, leads to better research outcomes, upholds the integrity of academic records, and supports administrative functions. Moreover, robust data governance practices are crucial for safeguarding sensitive information against unauthorised access and security breaches. The adoption of data governance policies safeguards personal data, financial information, and intellectual property, thereby ensuring the university's reputation and compliance with regulatory standards.

Table 2 presents an overview of participants' perceptions regarding data governance impacts in Indonesian public universities, derived from the thematic analysis detailed in Table 3. It highlights the interconnected and broad data governance benefits. As shown in Table 1, performance and decision-making are considered the primary benefits of data governance, with data quality and data security following as additional key advantages. This ranking suggests that stakeholders in Indonesian public universities primarily view data governance as a tool to enhance institutional efficiency and decision-making, with secondary attention given to data quality and security. The relatively lower emphasis on data security may indicate a need for greater awareness or prioritisation of cybersecurity and privacy protection within the wider data governance framework. The next section will explore these areas in greater depth, offering more detailed insights into the specific outcomes of implementing data governance in Indonesian public higher education institutions. This analysis will offer a deeper insight into the practical implications and highlight the significance of implementing comprehensive data governance practices to enhance university operations.

Table 2: Data Governance Implications

Data Governance Implications	Number of Participants
Performance	22
Decision making	15
Data quality	12
Data security	4

Table 3: Code, Themes, and Research Objectives

Code	Theme	Objectives
Authorisation	Data Security	Implications of Implementing Data Governance in Indonesian Public Universities
Authentication		
Accessibility		
Validity	Data Quality	
Timeliness		
Integrity		
Accuracy		
Fast	Decision Making	
Appropriate		
Performance	Performance	
Ensure		
Affect		

Performance

The quality of a university is reflected in its performance. Accreditation and university ranking are indicators of a university's performance. Accreditation and university ranking require accurate and reliable data. Data governance helps universities achieve their goals by managing university data.

"Data governance has an influence on university performance by raising the accreditation status of each study program", remarked participant 4.

Furthermore, Participant 12 stated that improving performance is possible through excellent data processing, implying that the university must develop effective data governance.

"First and foremost, when there is effective data processing, I see an increase in performance because it can be quantified and reported", he said. Participant 20 also said the same: "With good data governance, university performance improves because there is a clear indicator to see how the university is progressing".

These observations align with the work of Abraham et al. (2019) and Bhansali (2013). Performance is a potential outcome of implementing data governance, as a well-structured and effective data governance framework can improve an organisation's data management and decision-making processes (Abraham et al., 2019). By ensuring that data is accurate, reliable, and fit for its intended purpose, data governance enhances decision-making, efficiency, and productivity (Abraham et al., 2019). Additionally, data governance helps organisations achieve strategic objectives by fostering operational efficiency, lowering costs, and ensuring compliance with relevant regulations in a cost-effective way (Bhansali, 2013).

Furthermore, data governance contributes to improved performance by ensuring proper data management, storage, and protection (Al-Ruithe & Benkhelifa, 2020). It also enables efficient data sharing and integration across departments or business units, ensuring that data aligns with organisational goals and objectives. This involves establishing data governance policies and procedures that align with business processes and engaging key stakeholders in the governance process. Participant 12 emphasised that adopting data governance clarifies management's vision and makes decision-making more transparent. "With the implementation of data governance, management's vision gets clearer, so the decisions taken in the future also become clearer," they stated.

Moreover, data governance extends beyond internal operational efficiency and becomes an essential mechanism for demonstrating accountability to external stakeholders. The Indonesian government evaluates and grades public universities based on their performance. This grading system creates three tiers of universities, which have significant implications for government funding

allocations (Directorate General of Higher Education, Research and Technology, 2023; British Council, n.d.; World Education News & Reviews [WENR], 2014). Universities with higher performance scores receive greater financial support, incentivising them to strengthen governance and management practices—including data governance—to enhance transparency, effectiveness, and overall institutional excellence.

Decision Making

Every business, including the university, needs its leaders to make informed judgments. A good decision supported by solid evidence and knowledge. Good data governance implementation will help university authorities make better judgments(Al-Ruithe & Benkhelifa, 2020; Wende & Otto, 2007). Implementing strong data governance practices at a university can help leaders make informed decisions by ensuring access to accurate, reliable data. Effective decision-making requires data that is trustworthy, current, and relevant.

Regarding this, Participant 10 highlighted that with good data governance, a university can avoid lengthy decision-making processes and incorrect decisions. "So, if data governance is effective, the decision-making process must be fast and accurate so that actions can be carried out correctly and quickly, and the results are also in line with the goals, expectations, and demands. However, if data management is not enabled, such as decision-making, the process is lengthy and occasionally incorrect".

Strong data governance procedures guarantee that data is collected, managed, and utilised consistently, securely, and ethically, thereby enhancing its reliability and credibility. Related to this, Participant 2 mentioned, "Supporting officials' decisions with appropriate information because decision-making is based on data provided to them". Furthermore, Participant 12 also noted, "Hopefully, the decision will be more appropriate because the data in the observation is more quantifiable".

Through data governance implementation, universities can establish robust policies and procedures for managing data, including guidelines for data collection, storage, sharing, and analysis. This method enhances data accuracy and completeness, enabling leaders to make informed decisions based on reliable information (Gupta & Cannon, 2020). For example, with accurate data on student enrollment and academic performance, university leaders can identify areas where student support services can be improved or where additional resources may be needed to support academic programs.

Data governance can guarantee that data is effectively utilised for decision-making by enforcing quality control measures, including data validation,

cleansing, standardisation, and reconciliation. These practices ensure data accuracy, reliability, and completeness, which are essential for making informed, data-driven decisions. As Participant 17 emphasised, the goal of data governance implementation is to maintain high data quality, which in turn generates valuable information and supports sound decision-making: "The objective of data governance implementation is that we can maintain excellent data quality such that it generates good information, and good information generates good judgments."

Data governance plays a vital role in ensuring data is utilised effectively for decision-making by enforcing access controls that limit access to sensitive data to authorised individuals or groups. It also involves key stakeholders in the governance process, ensuring data is managed ethically and in compliance with regulations, protecting it from unauthorised access or misuse. Furthermore, data governance enhances data sharing and integration across departments or business units, aligning data usage with organisational goals. This is achieved through policies and procedures that support business processes and engage key stakeholders. Participant 13 emphasised that a key advantage of data governance is its ability to speed up decision-making, stating, "With data governance in place, data analysis can be conducted quickly, allowing decision-makers to act faster."

Moreover, while data-driven decision-making is widely recognised for enhancing transparency and accountability, its implementation within university governance structures can also generate resistance and tension. In some cases, the introduction of data governance frameworks challenges established decision-making hierarchies, particularly when data insights contradict managerial intuition or long-standing practices. Participants noted that decisions based solely on data metrics were occasionally perceived as undermining academic autonomy, especially among senior administrators accustomed to more discretionary approaches. This dynamic reflects the inherent tension between traditional governance norms and emerging data-driven cultures. Moreover, the implementation of data-driven decisions varies across Indonesia's multi-tier university system. Tier 1 universities, which generally possess more advanced digital infrastructure and governance maturity, tend to institutionalise data-driven practices more effectively, integrating them into strategic planning and performance evaluation. In contrast, Tier 2 and Tier 3 universities often face challenges such as limited data literacy, fragmented systems, and resource constraints, which can hinder the consistent implementation of decisions. As a result, while data governance serves as a unifying framework across the higher education sector, its practical application remains contingent on institutional

capacity, leadership commitment, and organisational readiness to embrace data-informed change.

Data Quality

Data quality is a vital component of effective data management, encompassing dimensions such as completeness, timeliness, validity, consistency, and integrity (Jim & Chang, 2018; Khatri & Brown, 2010; Olson, 2003). For universities, ensuring that data meets these standards is crucial, as it influences decision-making, reporting, compliance, and stakeholder trust. A significant concern for universities is the accuracy of their data, as inaccuracies or incompleteness can lead to flawed conclusions, suboptimal decision-making, and adverse outcomes for the institution.

In line with this, Participant 17 mentioned: "*With good data governance, it will be possible to ensure data validity and data integrity, resulting in good information from good data*". Furthermore, Data governance, according to Participant 3, has an influence on data quality and completeness *"Of course, it has an effect, particularly on the validity and completeness of data."* For example, if a university relies on inaccurate data to determine student enrollment numbers, it may make decisions that negatively impact its finances, staffing, and resources.

Ensuring high data quality is essential for data-driven decision-making and regulatory compliance. Data governance plays a critical role in maintaining data quality by implementing controls such as access restrictions, encryption, and masking to prevent unauthorised use or breaches. Additionally, it improves data quality by involving key stakeholders and promoting awareness of its importance. A well-structured data governance program should include business users, IT personnel, and data scientists to ensure data is effectively leveraged for organisational operations and decision-making. Moreover, data governance helps address challenges such as data lineage, enabling organisations to track data origins, transformations, and usage, thereby aiding in identifying and resolving quality issues.

By implementing clear policies, procedures, and guidelines for data management, universities can ensure that data is collected, stored, processed, and analysed consistently and accurately. Data governance initiatives may include policies for data validation and verification to guarantee accuracy and completeness before data is entered into systems. Additionally, it can establish standards for data classification and formatting, promoting uniformity across various systems and departments.

Participant 5 also highlighted *"Management becomes good, focused, and quantifiable with good data governance. The data flow is then likewise nice and transparent. Starting with data sources, the data output will be improved"*.

Through data governance implementation, universities can also safeguard data integrity, which relates to the data accuracy and consistency over time. This is critical to maintain the expectation of stakeholders, such as students, faculty, staff, and the broader community. Related to this, Participant 1 noted that an integrated system is important: *"In the case of compensation payment, for example, the user does not need to report the data again because it is created automatically"*. According to participant 1, within an integrated system, data is automatically generated for various purposes, such as computing compensation. When it comes to compensation calculations, staff need only provide the required documentation, and the system will perform the calculations based on the submitted documents.

Data Security

Data security is a vital outcome of data governance implementation within universities. Data governance policies and procedures are designed to safeguard data confidentiality, integrity, and availability by applying appropriate security measures. In this regard, Participant 6 highlighted that data governance helps prevent data loss, stating, "Second, data loss does not occur; we can anticipate data loss." By enforcing access controls, data governance restricts access to sensitive data to authorised personnel only. For instance, universities may establish protocols for managing student data, including encryption and access controls. This could involve user authentication and authorisation processes, as well as safeguards such as data encryption and masking to protect data during transmission and storage. Participant 20 emphasised that the responsibility for data access lies with the respective unit: "Because data access is a concern for all units, data protection is a shared obligation. If there is an issue with the username and password, the accountable unit is the unit in concern."

Moreover, data governance ensures security through incident response and disaster recovery plans, mitigating the risk of data breaches and ensuring data availability during emergencies. These plans define protocols for detecting and managing incidents, as well as strategies for rapidly restoring data after a breach or interruption. Moreover, enforcing data retention and disposal policies ensures that data is maintained only for the required duration and securely eliminated when no longer needed. Participant 13 highlighted the importance of these measures, noting, "The program has a security layer, backup, data access control, and other features." By involving the appropriate stakeholders and promoting a culture of data security, data governance programs can effectively safeguard data.

Business users, IT staff, and security professionals perform a vital function in embedding security into the overarching data governance strategy. Participant 4 pointed out that implementing data governance facilitates easier maintenance of information systems and data management, explaining, "There is a special unit ensuring security that has a role in activating data security before someone breaches the system."

Additionally, Participant 4 mentioned that data governance helps streamline the management of information systems, ensuring better security and regularity: "The advantage of implementing data governance is for security and regularity in managing information systems and data more easily, whether it's access, management, or sharing of data." Overall, data governance implementation significantly increases data security. A key objective is to create policies and procedures that protect the confidentiality, integrity, and availability of data, ensuring it is shielded from unauthorised changes or destruction, while remaining accessible to authorised users. By establishing clear data governance frameworks, universities can implement procedures such as access controls, encryption, backups, and disaster recovery to secure data. For example, a data governance program might include policies on password management, ensuring that users create strong passwords and update them regularly.

ANALYSIS

Integrative Analysis of Thematic Emphasis and Divergent Perspectives

The uneven emphasis across themes reflects variations in institutional priorities, governance maturity, and perceived ownership of data-related responsibilities. For example, while themes such as data quality and decision-making were widely discussed, data security received less emphasis because many participants viewed it as a purely technical or IT-centric concern rather than a governance responsibility. This perception is consistent with Nordin et al. (2022), who found that universities in developing contexts often focus on data accuracy and reporting compliance over strategic security management. Conversely, Desfiandi et al. (2024) observed that more mature institutions integrate data security into enterprise architecture, aligning it with strategic governance objectives. Divergent participant views also emerged: Tier 1 universities considered security embedded in governance structures, whereas Tier 2 and 3 universities regarded it as an operational matter managed by IT units. These contrasts, similar to findings by Ahmed et al (2023), highlight that governance practices are shaped by institutional culture, leadership commitment, and resource readiness. As Banks (2024) notes,

data governance evolves into a strategic enabler only when supported by formal cross-unit structures and collective accountability mechanisms.

A closer analysis of the thematic distribution shows that some themes—particularly data security and system integration—received less emphasis than performance and decision-making. This variation reflects differing levels of institutional readiness and contextual contingencies across the universities studied. In Tier 1 universities, where data governance frameworks and digital infrastructures are well established, security is often treated as an embedded operational process rather than an explicit strategic concern. In contrast, participants from Tier 2 and Tier 3 institutions described ongoing struggles with limited technical resources, fragmented systems, and insufficient human capacity, making it difficult to prioritise or articulate security-related initiatives. These differences suggest that governance maturity and contextual alignment significantly influence which aspects of data governance are emphasised (Ali, Green, Robb, & Masli, 2022; Nassou & Bennani, 2024). From a contingency theory perspective, such variation is expected, as effective governance structures depend on how well they fit the organisation's specific environment, resources, and objectives. Thus, the lower emphasis on security-related themes does not necessarily indicate neglect but rather reflects the adaptive prioritisation of governance elements in line with the institutional context.

Comparative insights among participants also reveal nuanced contradictions in how data governance is perceived and enacted. Some participants framed governance primarily as a technical safeguard focused on ensuring data accuracy, protection, and compliance. For example, Participant 6 emphasised preventive measures such as backups and access controls to "anticipate data loss." Others, however, positioned data governance as a strategic and managerial mechanism that supports transparency, decision-making, and institutional accountability. Participant 12, for instance, highlighted that governance clarifies "management's vision," linking it directly to organisational strategy. These differing interpretations underscore that data governance in universities is not uniform but socially and institutionally constructed. Such contradictions reflect varying degrees of governance maturity, leadership orientation, and digital literacy across institutional tiers. In line with contingency theory, these differences illustrate that governance effectiveness and emphasis are contingent on organisational context and capacity, reinforcing the idea that a one-size-fits-all governance model is unsuitable for higher education settings with diverse operational realities.

Data Governance and University Performance

The findings indicate that data governance significantly enhances university performance by improving accreditation, rankings, and strategic management. Participants consistently linked data governance to institutional performance, emphasising that accurate, reliable, and well-managed data form the foundation for achieving accreditation excellence and maintaining competitiveness. As Participant 4 remarked, "Data governance has an influence on university performance by raising the accreditation status of each study program," while Participant 12 noted that effective data processing "quantifies and reports performance improvement."

Data governance enhances performance by strengthening data integrity and accessibility, thus improving organisational efficiency and supporting performance-based evaluation systems (Abubakar et al., 2023). In the context of Indonesian public universities, where accreditation outcomes directly influence funding and public reputation, data accuracy and standardisation are essential. The Directorate General of Higher Education, Research, and Technology's (2023) tiered performance evaluation framework underscores this linkage, as higher-ranked universities receive increased state funding and strategic autonomy. Consequently, effective data governance not only supports internal management but also satisfies external accountability requirements.

Recent scholarship affirms this dual role of data governance—internally for decision-making and externally for transparency (Abubakar & Bakar, 2024). It facilitates alignment between institutional goals and data-driven strategies by integrating performance metrics into governance processes. This aligns with Participant 12's statement that "management's vision gets clearer, so decisions taken in the future also become clearer." Thus, data governance emerges as a strategic mechanism for ensuring performance consistency, accountability, and adaptability in an increasingly data-driven higher education environment.

Data Governance and Decision-Making

The data reveal that data governance plays a pivotal role in strengthening evidence-based decision-making within universities. Participant 10 highlighted that effective data governance shortens decision-making cycles and reduces errors: "If data governance is effective, the decision-making process must be fast and accurate."

Modern universities rely heavily on data-informed decisions for resource allocation, student success monitoring, and performance evaluation. It ensures consistency in data collection, management, and sharing, minimising uncertainty

and enhancing institutional responsiveness. Participant 17 emphasised this connection: "We can maintain excellent data quality such that it generates good information, and good information generates good judgments."

However, the integration of data-driven decision-making also introduces tension within traditional university governance structures. Participants noted resistance when data insights challenge managerial intuition or academic autonomy. This finding highlights that data governance in universities is not merely technical—it involves cultural and organisational transformation.

Institutional readiness, leadership commitment, and digital infrastructure significantly affect the success of data-driven decision-making (Nguyen et al., 2023). Tier 1 universities in Indonesia, which possess stronger governance maturity and technological capability, tend to integrate data governance into strategic management more effectively than lower-tier institutions. Conversely, Tier 2 and Tier 3 universities often face challenges such as fragmented systems and limited data literacy, hindering timely and accurate decision-making.

Ultimately, data governance transforms decision-making from intuition-based to evidence-based processes. Yet, realising its full benefits requires addressing organisational culture, developing data competencies, and establishing clear accountability structures that bridge technical governance and institutional strategy.

Data Quality and Integrity

Data quality emerged as one of the most critical outcomes of data governance implementation. Participants emphasised that data validity, completeness, and integrity are prerequisites for effective decision-making and performance monitoring. As Participant 17 stated, "With good data governance, it will be possible to ensure data validity and data integrity, resulting in good information from good data."

Universities increasingly depend on integrated data systems for administrative and academic functions. Participant 1 described the benefit of such systems: "In the case of compensation payment, the user does not need to report the data again because it is created automatically." This reflects growing evidence that system integration underpinned by governance protocols reduces redundancy and promotes consistency across institutional data assets (Alhassan & Sammon, 2021).

High data quality enhances institutional credibility and compliance with accreditation and regulatory reporting. Data governance ensures that data is validated, standardised, and verified before use, minimising inconsistencies that could otherwise compromise institutional decisions and reputation.

Data Governance and Data Security

Data security represents another vital dimension of effective data governance. The findings show that participants regard security as a collective responsibility that safeguards confidentiality, integrity, and availability. Participant 6 observed, "Data loss does not occur; we can anticipate data loss," illustrating how governance protocols such as access controls and data backups enhance institutional resilience.

Participant 13 highlighted the inclusion of "a security layer, backup, data access control, and other features," reflecting the practical implementation of these controls.

In the Indonesian higher education context, where universities manage vast amounts of student and research data, strong data governance structures mitigate the risks of data breaches and unauthorised access. As Participant 4 noted, a dedicated unit "ensuring security has a role in activating data security before someone breaches the system."

Overall, the findings underscore that data security is not a separate technical concern but an integral component of institutional governance. Effective data governance frameworks embed security and privacy mechanisms across all data processes, reinforcing trust, regulatory compliance, and institutional resilience.

DISCUSSION

Synthesising these themes, the findings demonstrate that data governance is a foundational enabler of institutional performance, decision-making quality, data reliability, and data protection. The interrelationships among these dimensions reinforce a cyclical model: strong data governance improves data quality and security, which in turn enhances decision-making and organisational performance. These emerging frameworks describe data governance as a socio-technical system that integrates policy, process, and culture (Khatri et al., 2010;). Based on these findings, we proposed a data governance framework for public universities as shown in Figure 1.

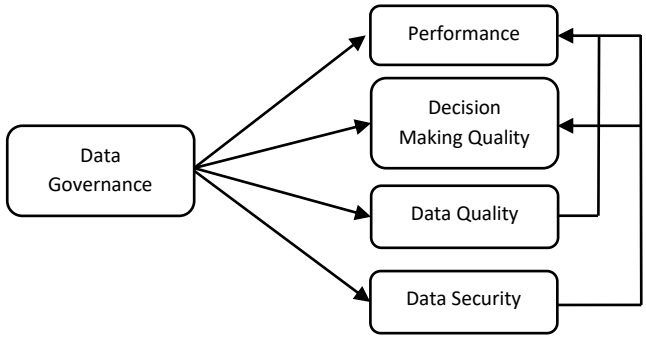

Figure 1: Data Governance Framework for Public Universities

However, the study also reveals uneven governance maturity across Indonesian public universities, shaped by infrastructure readiness, leadership commitment, and institutional culture. This heterogeneity suggests that a contingency-based approach—tailoring governance mechanisms to institutional context—may be essential for achieving sustainable and scalable data governance implementation in the higher education sector.

CONCLUSION AND RECOMMENDATIONS

Data governance implementation is vital for enhancing organisational performance by ensuring data accuracy, reliability, and appropriateness for its intended uses. In educational institutions such as universities, where large volumes of data are generated, strong data governance is crucial to supporting both academic and administrative functions. This study explores the impacts of data governance on organisational effectiveness, specifically how it contributes to better decision-making, increased efficiency, and the achievement of strategic objectives. By strengthening data governance through organisational processes, institutions can embed robust data management practices into their daily operations, maintaining high standards of data quality and security.

Effective governance addresses critical aspects of data quality, such as accuracy, completeness, consistency, and timeliness, fostering trust among stakeholders and enabling well-informed decisions. In addition, involving stakeholders in the process helps cultivate a data stewardship culture in which the value of preserving high-quality data is acknowledged and protected. For universities, this results in unified data management across departments, encouraging collaboration and breaking down data silos.

Furthermore, data governance protects institutional data through rigorous security measures, incident response protocols, and disaster recovery plans. By

establishing clear policies for data retention and disposal, universities can safeguard sensitive information against breaches and misuse while ensuring data availability and reliability. Public universities should establish dedicated data governance offices or committees that coordinate cross-departmental data management efforts, ensuring standardisation and accountability across all functional areas. This comprehensive data governance framework ultimately supports the university's academic mission, boosts productivity, and builds stakeholder trust. The study aims to shed light on how implementing data governance practices influences organisational performance and data-driven decision-making, providing valuable insights into its role within higher education institutions.

However, this study faced several limitations due to the use of online interviews. Issues such as poor internet connectivity and unclear questions or responses affected the data collection process. The absence of nonverbal cues and subtle communication nuances in online interviews can also limit the depth and richness of the data, which are often crucial for fully understanding participants' responses. Moreover, the study encountered resistance from certain universities, resulting in a smaller sample size. This limitation could affect the representativeness of the findings and limit the generalisability of the results to a broader population. Furthermore, the limited availability of documentation on data governance implementation posed a challenge. Future research could explore not only the implications but also the factors influencing the adoption of data governance. Furthermore, research could explore the relationship between data governance and emerging technologies such as machine learning and artificial intelligence, given their growing importance in the field.

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