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Governing Neural Data in the Global South: Toward a Neuro-Responsible Business Framework for Zambia

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ABSTRACT

This study examines the governance of neural data generated through brain–computer interfaces and cognitive monitoring systems within Zambia's business management context. Using a qualitative multiple-case study design, data were collected through semi-structured interviews, observations, and document reviews across legal, corporate, regulatory, and academic sectors. The study identifies four interrelated themes: gaps in legal and regulatory frameworks, limited institutional and technical capacity, ethical and managerial implications of neurotechnology adoption, and socio-cultural considerations, particularly cognitive dignity. The findings reveal that although Zambia's existing data protection framework provides a foundational basis for information governance, it lacks explicit recognition of neural data and faces significant challenges related to regulatory readiness, institutional expertise, and ethical guidance. This study makes a novel contribution by offering one of the first empirical analyses of neural data governance in a developing country business context. It further advances theory and practice by proposing a Neuro-Responsible Governance Model, which integrates principles of mental privacy, cognitive liberty, and ethical innovation into corporate and policy decision-making. The study contributes to emerging debates on neurotechnology governance, business ethics, and data protection, and provides actionable insights for policymakers, regulators, and business leaders navigating the neuro-digital era.

1. Introduction

The emergence of neurotechnology within business and governance contexts presents unprecedented opportunities alongside complex ethical, legal, and institutional challenges (Eke, 2024). As digital transformation accelerates across developing regions, the incorporation of neural data derived from brain–computer interfaces and cognitive monitoring systems into organisational decision-making raises critical questions concerning data protection, autonomy, and human rights (Said, 2025). Within neurolaw scholarship, neural data are increasingly conceptualised as a uniquely sensitive category of information, given their capacity to reveal cognitive states, intentions, and emotional processes (Reeck et al., 2023). However, the implications of this recognition for

business management practices and corporate governance remain underexplored, particularly in developing country contexts such as Zambia.

Globally, emerging neurolaw frameworks demonstrate growing legal awareness of the need to regulate neural data. Jurisdictions such as Chile have introduced constitutional reforms recognising cognitive rights (Cornejo-Plaza et al., 2024), while US states including Colorado and California have begun integrating neural data into privacy and consumer protection regimes (George, 2024; Magee et al., 2024). These developments illustrate a gradual convergence between legal theory, technological innovation, and organisational accountability. Yet, most Global South countries continue to rely on conventional business and data governance frameworks that were not designed to regulate cognitive or affective information generated through neurotechnological systems. This disconnect underscores a critical theoretical gap between neurolaw's normative insights and the operational realities of business management in emerging economies.

In Zambia, the Data Protection Act (2021) represents an important milestone in the regulation of personal data within both public and private sectors. Nevertheless, the Act does not explicitly recognise neural data as a distinct category of information, nor does it address its potential use in organisational contexts such as employee monitoring, consumer analytics, or performance optimisation. From a business management perspective, this omission raises concerns about accountability, consent, and power asymmetries between organisations and individuals. The use of neurotechnologies in managerial decision-making may amplify existing informational imbalances, enabling deeper forms of surveillance and behavioural influence if left insufficiently regulated (Chand et al., 2025).

The governance gap surrounding neural data in the Global South thus extends beyond legal classification to encompass broader institutional and socio-cultural considerations. Without locally grounded governance models, there is a risk that neurotechnology regulation will be shaped by externally developed norms that fail to reflect domestic business practices, regulatory capacity, and cultural understandings of mental autonomy. Effective governance therefore requires not only legal reform but also institutional capacity-building and ethical guidance tailored to Zambia's socio-legal and organisational environment. Integrating neurolaw principles such as mental privacy and cognitive liberty into business data governance frameworks offers a pathway toward more responsible and context-sensitive innovation.

Against this backdrop, this study examines how Zambia's existing data protection framework addresses (or falls short of addressing), the governance of neural data within business and organisational contexts. Employing a qualitative multiple-case study design, the research analyses legal, regulatory, corporate, and academic perspectives to assess institutional readiness, legal adequacy, and socio-cultural influences on neurotechnology governance. By explicitly linking neurolaw theory with business management and data governance practices, the study contributes to an emerging interdisciplinary literature on neuro-responsible governance. The findings aim to inform national policymakers, regulators, and business leaders, while also advancing international scholarly debates on law, neurotechnology, and ethical innovation in emerging economies.

2. Literature Review

The integration of neurotechnology into business, healthcare, and governance has generated significant ethical, legal, and socio-economic debate, particularly concerning the ownership, protection, and permissible use of

neural data (Muravieva, 2025). Neural data produced through brain–computer interfaces (BCIs), neuroimaging systems, and cognitive monitoring technologies present distinctive regulatory challenges because of their capacity to reveal mental states, intentions, and affective processes (Ruiz-Vanoye et al., 2024). Scholars including Ienca, Andorno, and Yuste have emphasised that neural data constitute the most intimate category of personal information, given their direct relationship to identity, autonomy, and cognitive integrity (Possa, 2025). Within business environments, neurotechnological applications are increasingly deployed to enhance productivity, assess cognitive engagement, and optimise organisational decision-making (Thiruchanuru, 2024). Yet, particularly in emerging economies such as Zambia, regulatory and governance frameworks have not evolved at a commensurate pace, producing a widening gap between technological adoption and institutional preparedness. From a neurolaw perspective, the governance of neural data is grounded in established principles of data sovereignty, informational self-determination, and human rights jurisprudence. Informational self-determination, as articulated by Martin and Metzger (2024), reflects the individual's right to control the generation, processing, and dissemination of personal information, a principle also embedded within the Council of Europe's Convention 108+ (2018). In Africa, the African Union Convention on Cyber Security and Personal Data Protection (Malabo Convention, 2014) recognises the need for digital data protection but does not expressly address neural or cognitive information (Raji et al., 2025). This omission has prompted scholars such as Ochang et al. (2024) to argue for region-specific governance frameworks that integrate ethical, cultural, and socio-institutional considerations rather than relying on externally derived regulatory models that may not align with African epistemologies or social structures.

Neuro-rights theory has emerged as a prominent conceptual response to these governance challenges. Sommaggio (2024) identifies five foundational neuro-rights—mental privacy, personal identity, cognitive liberty, equal access to cognitive enhancement, and freedom from algorithmic bias—designed to safeguard individuals against intrusive neurotechnological practices. Chile's constitutional recognition of neuro-rights in 2021 represents a significant legal milestone and provides a comparative reference point for other jurisdictions (Undurraga, 2025). Aimen (2025) further argues that embedding neuro-rights within data protection regimes is essential to prevent forms of "cognitive surveillance," particularly where neurotechnologies are deployed by employers or corporations. In organisational contexts, the use of neuroergonomic devices and attention-monitoring technologies raises acute ethical and managerial concerns, as productivity-driven applications may undermine cognitive autonomy and informed consent, especially in labour markets characterised by power asymmetries.

The adequacy of data protection regimes plays a critical role in shaping how neural data are governed in practice. The European Union's General Data Protection Regulation (GDPR) provides a benchmark framework by categorising biometric and health-related information as "special category data" requiring enhanced protection (EU GDPR, 2016; Açıkyıldız, 2024). However, the absence of an explicit definition of neural data within the GDPR has generated interpretive uncertainty. Scholars such as Madrid (2025) and Akhtar and Victor Stany Rozario (2025) contend that neural data possess distinctive epistemic properties, given their capacity to expose subconscious cognitive and emotional states. As a result, the extension of existing privacy regimes to neurotechnological data without express legal recognition may be insufficient to address the full spectrum of ethical and governance risks.

In Zambia, the Data Protection Act 2021 establishes core principles of consent, purpose limitation, and data minimisation but does not explicitly recognise neural or cognitive data as a distinct category of protected information. While the Act broadly aligns with GDPR-inspired standards, it remains limited in its capacity to regulate emerging neurotechnological applications within business and organisational settings. This legislative silence generates uncertainty for firms employing biometric and neurocognitive analytics tools and places pressure on regulatory bodies such as the Zambia Information and Communications Technology Authority (ZICTA) and the Office of the Data Protection Commissioner, which currently lack specialised technical and institutional expertise in neurotechnology governance. These challenges reflect broader patterns across the Global South, where constrained regulatory capacity and evolving policy ecosystems hinder effective oversight of advanced neurotechnologies.

Beyond legal compliance, the literature highlights the growing ethical and managerial implications of neurotechnology adoption within business contexts. In neuroeconomics and neuromarketing, neural data are increasingly used to predict consumer behaviour and assess employee engagement (Karim, 2025). While such practices promise enhanced organisational efficiency, they simultaneously blur the boundary between personal cognition and corporate data ownership. Traunwieser (2024) cautions that these developments risk transforming employees into "data subjects of their own thoughts," raising fundamental concerns regarding autonomy, consent, and workplace surveillance. From a business management perspective, this shifts the governance challenge from narrow regulatory adherence to broader questions of organisational ethics, transparency, and trust-based data stewardship. The literature reveals that neural data governance remains an evolving and fragmented field characterised by conceptual ambiguity, regulatory divergence, and ethical complexity (Ghosh et al., 2025; Ilcic et al., 2025; Radanliev, 2025). Empirical research examining how developing countries, particularly in Sub-Saharan Africa are adapting their legal and business governance frameworks to address neurotechnology remains limited. This study responds to that gap by analysing Zambia's Data Protection Act (2021) through the lenses of neurolaw, business management, and cognitive privacy. By explicitly linking legal theory with organisational practice, the study advances an integrated understanding of how neural data governance can evolve to support ethical innovation, regulatory legitimacy, and responsible business conduct in the neuro-digital economy.

Gap Analysis

Taken together, the literature reveals three interrelated gaps that this study seeks to address. First, an empirical gap exists in relation to how neurotechnologies are currently understood, used, and governed within workplace and business contexts in Sub-Saharan Africa, where most existing studies remain conceptual or Global North–focused. Second, there is a theoretical gap in the integration of neuro-rights and neurolaw principles with business management and corporate governance frameworks, as legal scholarship and organisational research largely evolve in parallel rather than in dialogue. Third, a contextual gap persists regarding regulatory readiness and institutional capacity in Global South jurisdictions, particularly in relation to the classification and governance of neural data under existing data protection regimes. Addressing these gaps is essential to developing context-sensitive, ethically grounded, and practically applicable models of neuro-responsible governance, and provides the justification for the present study's qualitative, multi-stakeholder research design.

3. Theoretical and Conceptual Framework

This study is grounded in an integrated theoretical and conceptual framework that brings together neurolaw, neuro-rights theory, and business governance theory to examine the governance of neural data within organisational contexts in Zambia. The framework is designed to move beyond descriptive accounts of regulation and ethics by systematically linking established legal and governance theories to emerging neurotechnological practices in business environments.

At the legal-theoretical level, the framework draws on neurolaw and neuro-rights theory, which conceptualise neural data as a uniquely sensitive category of personal information due to its direct connection to cognition, identity, and mental autonomy. Neuro-rights principles, particularly mental privacy, cognitive liberty, and identity integrity, provide the normative foundation for assessing the legitimacy of neural data collection and use. These principles extend traditional data protection and human rights jurisprudence by recognising cognition itself as a site of legal and ethical vulnerability.

At the organisational level, the framework is informed by business governance and corporate ethics theory, which emphasise accountability, transparency, and responsible decision-making in the management of advanced technologies. Within this perspective, firms are understood not merely as data processors but as governance actors whose managerial choices shape power relations, consent practices, and trust in digital workplaces. Integrating neurolaw into business governance highlights how legal norms concerning cognitive protection must be operationalised through internal policies, risk management processes, and ethical oversight mechanisms.
Conceptually, the framework introduces Neuro-responsible governance as the integrative construct linking these domains. Neuro-responsible governance refers to the obligation of organisations and regulators to ensure that neurotechnological innovation proceeds in a manner that safeguards cognitive dignity, respects mental autonomy, and maintains institutional legitimacy. This concept bridges legal norms and managerial practice by translating neuro-rights into governance expectations relevant to organisational contexts.

Within this framework, three interrelated analytical dimensions guide the empirical investigation:

1. Legal adequacy, examining whether existing data protection laws recognise and protect neural data;
2. Institutional and managerial capacity, assessing regulatory readiness and organisational competence to govern neurotechnologies; and
3. Ethical and socio-cultural alignment, evaluating how governance approaches resonate with local understandings of mental integrity and cognitive dignity.

Together, these elements provide a structured theoretical lens through which Zambia's neural data governance landscape is analysed. By grounding the study in established neurolaw and business governance models, the framework ensures conceptual coherence and supports the development of context-sensitive, empirically informed insights into neurotechnology governance in emerging economies.

4. Data and Methodology

Introduction

This chapter outlines the research design, methods of data collection, analytical procedures, and strategies adopted to ensure the reliability and validity of the study. The research examined whether neural data should be explicitly protected within Zambia's business management environments. It was conducted against the backdrop

of the Data Protection Act 2021, with the central aim of evaluating whether the Act sufficiently addresses the emerging category of neural data generated through neurotechnologies and digital tools increasingly deployed in workplaces.

Research Design

A qualitative multiple-case study design was employed to explore legal, regulatory, and managerial perspectives on neural data protection. Consistent with Merriam (1998, 2009), Yin (2011), and Creswell (2013), the multiple-case approach was selected to enable analytic comparison across institutions and stakeholder groups while preserving contextual depth. This design is particularly suited to underexplored and emerging phenomena such as neural data governance, where theory remains nascent and context-sensitive understanding is required.

Sample Size and Organisational Selection

A purposive sample of sixty participants was selected to ensure information-rich cases rather than statistical representativeness. The sample size is justified on the basis of thematic saturation, as recommended in qualitative research, whereby additional interviews no longer yielded substantively new insights. Participants were drawn from four organisational categories law firms, corporate organisations, regulatory agencies, and academic institutions to capture diverse yet complementary perspectives on neural data governance.

Organisations were selected based on their direct involvement in data governance, digital transformation, or regulatory oversight, as well as their relevance to emerging neurotechnological practices. Corporate organisations included those utilising advanced digital monitoring or biometric systems, while regulatory bodies were selected for their statutory responsibility over ICT and data protection. This selection strategy enabled cross-case triangulation and strengthened analytical validity.

Methods of Data Collection

Data collection occurred over an eight-week period (July–September 2025) using semi-structured interviews, non-participant observation, and document analysis. Semi-structured interviews (45–60 minutes each) allowed for consistency across participants while enabling probing of emerging issues (Brinkmann & Kvale, 2015). Observations were conducted in three organisations using advanced monitoring systems, providing contextual insight into consent practices, data storage, and accountability mechanisms (Flick, 2018). Document analysis included statutory instruments and organisational policies, enabling comparison between formal regulation and operational practice (Bowen, 2009).

Data Analysis and Coding Development

Data analysis followed a thematic analysis approach, combining inductive and deductive coding. Initial open coding was conducted to identify recurring concepts emerging from the data. These codes were subsequently refined through axial coding, guided by the study's theoretical framework, particularly concepts from neurolaw such as, mental privacy, data governance, such as consent and accountability, and business ethics, such as trust and autonomy. Coding categories were iteratively reviewed and consolidated to ensure internal consistency and theoretical alignment. The use of multiple data sources enabled triangulation, enhancing credibility and dependability (Lincoln & Guba, 1985; Patton, 2014). Reflexive memoing and peer debriefing further strengthened analytical rigor.

Data analysis followed a thematic analysis approach combining inductive and deductive coding, consistent with Braun and Clarke's (2006) six-phase framework, as explicated by Maguire and Delahunt (2017). These codes were subsequently refined through axial coding, guided by the study's theoretical and conceptual framework, particularly neurolaw constructs such as mental privacy and data governance principles including consent and accountability, as well as business ethics concepts such as trust and autonomy. Coding categories were iteratively reviewed and consolidated to ensure internal coherence and theoretical alignment. The use of multiple data sources enabled triangulation, enhancing the credibility and dependability of the findings (Lincoln & Guba, 1985; Patton, 2014). Reflexive memoing and peer debriefing were employed throughout the analytic process to further strengthen rigor and transparency.

The analysis began with familiarisation, during which the researcher read and re-read interview transcripts, observation notes, and documents to gain a holistic understanding of the data. Using NVivo 14, significant statements and recurring ideas were coded, allowing for systematic data management and retrieval (Jackson & Bazeley, 2019). Codes were subsequently grouped into broader themes such as Legal Gaps in the Data Protection Act, Neural Data as Sensitive Personal Data, and Ethical and Employment Implications. Themes were iteratively reviewed and refined to ensure internal coherence and conceptual clarity, consistent with qualitative best practice (Nowell et al., 2017). Sub-themes were also developed to capture nuanced variations in participant perspectives. The final phase involved constructing an interpretive narrative that integrated the major themes and addressed the research objectives. Microsoft Excel was used to summarise demographic information and generate descriptive statistics from closed-ended questions. This systematic, transparent, and iterative analytic process enhanced both the trustworthiness and interpretive depth of the findings.

Reliability and Validity

To ensure the trustworthiness and rigour of the findings, several methodological safeguards were incorporated throughout the research process. Member checking was conducted by providing participants with summaries of their interview transcripts for verification of factual accuracy and interpretive authenticity (Birt et al., 2016). Interview questions were also shared in advance to support informed participation.

Triangulation was achieved by integrating data from interviews, observations, and document reviews, thereby enhancing the credibility and convergence of evidence (Lincoln & Guba, 1985; Shenton, 2004). An audit trail, including field notes, coding logs, and reflective memos was maintained to document analytic decisions and promote transparency (Korstjens & Moser, 2018). Standardisation was also ensured through the consistent use of an interview guide and observation checklist across all participants and organisational sites.

Ethical compliance was rigorously maintained: formal approval was obtained from the institutional review board, informed consent was secured from all participants, and confidentiality was preserved in accordance with the Zambian Data Protection Act No. 3 of 2021.

Collectively, these measures strengthened the credibility, dependability, confirmability, and transferability of the results, aligning with established qualitative research quality criteria (Lincoln & Guba, 1985; Drost, 2011; Leung, 2015). They ensured that the study's interpretations were authentic, unbiased, and reflective of participants' lived experiences.

Summary

This study employed a qualitative multiple-case study design, integrating semi-structured interviews, direct observations, and document reviews to examine the recognition and protection of neural data within Zambia's business management context. Data were analysed thematically using NVivo 14 and Microsoft Excel to identify, code, and interpret recurring patterns and relationships. Methodological rigour was ensured through triangulation, member checking, the maintenance of an audit trail, and strict adherence to ethical research standards.

Collectively, this methodological framework provided a credible and robust foundation for assessing how Zambia's Data Protection Act (2021) could evolve to formally recognise neural data as a distinct and protected category of personal information. The insights derived from this process inform the empirical findings, analytical discussions, and policy recommendations presented in the following chapters.

5. Findings and Discussion

This study explored the extent to which Zambia's *Data Protection Act* (2021) safeguards neural data generated through neurotechnological applications in business management settings. Drawing on semi-structured interviews, direct observations, and document reviews, data from sixty participants representing legal, regulatory, corporate, and academic sectors were analysed thematically.

The analysis yielded four overarching themes:

1. Legal and Regulatory Gaps in Neural Data Protection,
2. Institutional Readiness and Capacity,
3. Ethical and Managerial Implications of Neurotechnology Adoption, and
4. Socio-Cultural and Cognitive Dignity Considerations.

Before presenting the thematic analysis, the participants' biographical and professional characteristics are summarised below to contextualise the findings.

Characteristic	**Category**	**n (%)**
Gender	Female	33 (55)
	Male	27 (45)
Sector of Employment	Legal/Regulatory	15 (25)
	Corporate (Private Sector)	18 (30)
	Academic/Research	10 (17)
	Civil Society/Advocacy	9 (15)
	Technology/ICT	8 (13)
Highest Qualification	Master's Degree	21 (35)
	Bachelor's Degree	31 (52)
	Diploma/Certificate	8 (13)
Age Group	20–29 years	10 (17)
	30–39 years	25 (42)
	40–49 years	16 (27)
	50 years and above	9 (14)
Professional Experience	1–5 years	12 (20)

	6–10 years	23 (38)
	11–15 years	15 (25)
	16 years and above	10 (17)

Overview of Findings

The objective of this study was to examine how legal, institutional, ethical, and socio-cultural factors shape the recognition and protection of neural data within Zambia's emerging neurotechnology landscape. Thematic analysis revealed that leadership, regulatory capacity, and ethical awareness play pivotal roles in determining how neural data are understood, managed, and governed. Following a rigorous review of the data, it is evident that Zambia's readiness for neural data governance is both promising and constrained by gaps in law, expertise, and ethical frameworks. The perspectives of interview participants and respondents are presented below through the four major themes that emerged.

Theme 1: Legal and Regulatory Gaps in Neural Data Protection

Findings indicate that Zambia's **Data Protection Act (2021)** does not explicitly recognize **neural data** as a distinct category of personal information. While the Act aligns with global privacy principles of consent, purpose limitation, and data minimization, it remains silent on data that reveal thoughts, emotions, or cognitive states.

> *"The current law assumes all personal data are equivalent, yet neural data goes deeper—it is the person's mind itself."*
>
> *(Participant 7, Legal Practitioner)*

Another legal expert reinforced this concern by highlighting interpretive uncertainty:

> *"If a dispute arose today involving brain-derived data, it would be very difficult to say with confidence how the law should apply."*
>
> *(Participant 12, Legal Scholar)*

The absence of definitional clarity exposes Zambia to potential regulatory obsolescence, particularly as jurisdictions such as California (SB 1223) and Colorado (H.B. 24-1058) have moved to explicitly recognise neural data as a form of sensitive personal information. The study therefore supports legislative refinement to classify neural data as a distinct category of sensitive personal information requiring enhanced consent protocols, algorithmic transparency, and oversight mechanisms consistent with cognitive dignity and informational self-determination

Theme 2: Institutional Readiness and Capacity

Institutional analysis revealed significant disparities in regulatory preparedness across government bodies, corporate actors, and legal practitioners. Officials acknowledged ongoing efforts in digital governance but conceded a lack of specialized technical expertise for managing neural data.

> *"Our frameworks were designed for conventional digital information, such as emails, biometrics, financial data, but not for technologies that read brain signals."*
>
> *(Participant 3, Regulatory Officer)*

Another regulatory respondent emphasised the skills gap:

> *"Even if the law were amended tomorrow, we would still struggle to enforce it without specialised technical training."*
>
> *(Participant 11, Data Protection Officer)*

Corporate observations indicated that neurobiometric data are frequently stored on third party cloud servers without localisation or adequate encryption safeguards (Chinyemba & Phiri, 2018). These practices highlight infrastructural and governance challenges typical of emerging digital economies, where regulatory frameworks and institutional capacity often lag behind technological adoption (Hamapa et al., 2024). The findings underscore the need for Zambia's institutions to be proactively strengthened through technical training, cross-sector collaboration, and international cooperation. Without such reforms, regulators risk remaining reactive rather than anticipatory, which could undermine the credibility and effectiveness of future neuro-governance frameworks.

Theme 3: Ethical and Managerial Implications of Neurotechnology Adoption

Respondents identified increasing managerial interest in neurotechnological tools for productivity tracking, consumer analytics, and risk assessment, yet expressed concern over blurred boundaries between personal cognition and corporate oversight.

> *"When employers can see how focused or distracted you are, even your fatigue levels, it changes the trust relationship completely."*
> *(Participant 14, Human Resource Manager)*

Another corporate respondent highlighted ethical ambiguity surrounding consent and managerial authority:

> *"Employees may sign consent forms, but in reality, refusal is not a real option when your job depends on compliance. That raises serious ethical questions about voluntariness."*
> *(Participant 21, Corporate Compliance Manager)*

This dynamic reflects the neuroethical tension between efficiency optimization and cognitive autonomy (Ienca & Andorno, 2017; Magnani, 2020). Current corporate governance remains largely compliance oriented, emphasizing procedural consent over substantive mental privacy. The study therefore advocates ethics by design approaches that embed neurorights, mental privacy, identity integrity, and cognitive liberty into organizational policy. Doing so reframes ethics as a strategic management function rather than a legal formality, enhancing trust, transparency, and accountability in neuroaugmented workplaces.

Theme 4: Socio-Cultural and Cognitive Dignity Considerations

A distinctly Zambian perspective emerged regarding the cultural sanctity of the mind and its moral implications for neurotechnology deployment.

> *"In our culture, the mind is sacred—what a person thinks is between them and God. Technology that reads those thoughts must be handled with extreme caution."*
> *(Participant 10, Academic Researcher)*

A civil society representative similarly noted:

> *"People may consent on paper, but they do not fully grasp what it means for their thoughts to become data."*
> *(Participant 28, Civil Society Advocate)*

These views resonate with post-colonial data-ethics scholarship, which cautions against uncritical adoption of Eurocentric regulatory models in African contexts (Segun, 2024; Mahamadou et al., 2024). Participants stressed that public awareness of neurotechnologies remains low, heightening the risk of uninformed consent. Inclusive, participatory policymaking, engaging educators, civil society, and faith-based institutions was therefore seen as essential to legitimate neuro-governance. The study introduces the concept of cognitive dignity: the preservation of mental integrity, autonomy, and privacy of thought as a moral and legal cornerstone of Zambia's digital-governance architecture.

Synthesis and Theoretical Implications

Synthesising across the four themes, the study finds that Zambia's current data-protection framework, while progressive, remains legally under-specified, institutionally fragile, and ethically emergent for the neuro-digital era (Chinyemba & Phiri, 2018; Hamapa et al., 2024; Segun, 2024). Participants' accounts highlight how the absence of explicit neural data recognition, limited institutional expertise, and low public awareness collectively constrain effective governance.

Extending Ienca and Andorno's (2017) argument, the findings indicate that effective governance of neural data in the Global South requires context-specific adaptation rather than wholesale adoption of neuro-rights frameworks from advanced jurisdictions. In particular, the study demonstrates that informational self-determination—the principle that individuals should control how their personal and cognitive data are collected, processed, and shared—remains only partially realised in Zambian organisations and regulatory systems. Similarly, participants' emphasis on mental privacy and the cultural sanctity of thought aligns with the broader principle of human dignity, which underpins both international human rights law and neuro-rights theory.
Building on these theoretical linkages, the study proposes a Neuro-Responsible Governance Model encompassing three interdependent dimensions:

1. Legal Recognition – Formal classification of neural data as a sensitive category under the Data Protection Act, operationalising neuro-rights principles such as mental privacy, cognitive liberty, and personal identity (Sommaggio, 2024; Undurraga, 2025).
2. Institutional Strengthening – Creation of specialised regulatory units, technical capacity-building programs, and inter-agency collaboration to ensure enforceability and proactive oversight, aligning with the principle of informational self-determination.
3. Ethical Embedding – Integration of neuro-rights and human dignity principles within public policy and corporate governance frameworks, embedding ethics by design into organisational processes (Mahamadou et al., 2024).

The findings suggest that neurotechnology governance in Zambia is in a formative yet promising stage. While current legislation provides a foundation, it lacks the precision, institutional capacity, and ethical coherence required to safeguard neural data effectively. Importantly, this early stage offers a unique opportunity to indigenise global neuro-rights discourses, situating Zambia as a potential regional leader in neuro-responsible governance. Through targeted law reform, institutional capacity development, and public education, Zambia can align technological innovation with the protection of cognitive sovereignty, mental privacy, and human dignity, thereby embedding neuro-rights principles within both legal and managerial practices.

6. Conclusion

This study examined the governance of neural data in Zambia's business management context, focusing on the intersection of neurotechnology, privacy, ethics, and digital governance. Using a qualitative multiple-case study approach, data were collected through semi-structured interviews, direct observations, and document reviews across legal, corporate, regulatory, and academic sectors. Thematic analysis revealed four key domains: legal and regulatory gaps, institutional readiness and capacity, ethical and managerial implications of neurotechnology adoption, and socio-cultural considerations emphasizing cognitive dignity.

Findings indicate that while Zambia's Data Protection Act (2021) provides a foundational framework, it lacks explicit recognition of neural data, faces institutional capacity constraints, and has emerging ethical gaps. Embedding culturally grounded values such as Ubuntu and relational ethics into policy and corporate governance could help address these shortcomings, promoting cognitive autonomy, ethical reciprocity, and shared responsibility.

The study advances several theoretical contributions. First, it demonstrates the applicability of neuro-rights, informational self-determination, and human dignity frameworks in the context of business management, linking these principles to organisational ethics, managerial decision-making, and regulatory practice. Second, it offers a context-sensitive approach to neuro-responsible governance in the Global South, showing how local socio-cultural values can mediate the adoption and implementation of neurotechnology governance, rather than relying solely on imported legal or ethical models. By integrating legal, managerial, and socio-cultural perspectives, the study contributes to a more holistic and interdisciplinary understanding of neural data governance.

From a policy and practice perspective, three priorities emerge:

1. Revising legislation to formally recognize neural data as sensitive information;
2. Strengthening institutional capabilities through specialized regulatory units, technical training, and inter-agency collaboration; and
3. Enhancing public awareness to ensure informed consent and equitable participation in neurotechnology governance.

The global relevance of this work lies in its demonstration that neuro-responsible governance models can be adapted to emerging economies while respecting local socio-cultural and ethical norms. This approach provides a blueprint for other jurisdictions in the Global South seeking to safeguard cognitive dignity, mental privacy, and ethical innovation, while integrating neuro-rights principles into both legal frameworks and organisational governance.

While this study provides critical empirical and contextual insights, future research incorporating additional jurisdictions, longitudinal stakeholder engagement, and comparative analysis would deepen understanding of policy implementation and lived experiences. Overall, the findings support the development of a Neuro-Responsible Governance Framework for Zambia and similar contexts, which integrates ethical, legal, and cultural dimensions to foster responsible innovation in the neuro-digital era.

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