



Counting the Uncounted: Informality, Statistical Invisibility, and the Problem of Measuring Human Realities in West Africa

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Abstract

This article examines from a system lens, the data invisibility that has persisted in the West African economic infrastructure and social ecosystem. Consisting a key element in the question of limitations and exclusivity regarding balanced economic flourishing, what is observed is a pattern of inherited concepts of control that directly influences who and what is counted by following the historical genealogy of enumeration from colonial governance to modern data regimes. The study makes the case that structural, institutional, and epistemological legacies continue to systematically remove the informal majority which includes unregistered persons, informal labor, and marginalized communities from official statistics. The article shows that invisibility is a strategic and ethical condition ingrained in statecraft rather than a technical failure by synthesizing historical investigation, structural critique, and data science viewpoints. It also looks at how more inclusive, contextually aware, and morally sound systems of visibility might be made possible by contemporary data science, participatory mapping, and digital infrastructures. Having examined the causes of this pattern of enumeration in the middle section of the article, it then as a conclusive pragmatic attempt to ideation, calls to initiate the decolonization of data mining and utility and also for the reinstatement of African epistemic independence in statistical governance, redefining enumeration as an action of justice rather than administration.

Keywords: Statistical invisibility, Informal economy, Data sovereignty, Data science, Epistemic Dependence

1. Introduction

Since the dawn of civilization, the practice of registering, counting and categorizing individuals and social operation has been essential to modern government since it identifies "the people" and also promotes political representation of everyone in a society. Beyond this enumeration as a practice has also been instrumental to the formulation of state policies, resource allocation since the original idea is to know the needs of the counted and meet them. However, in many West African states, there has for years been a practice of omission which is mainly characterized by factors such as negligence, lack or access to precise enumeration tools suitable for accurate representation of a population. This problem, which is broadly known as statistical invisibility, is a structural condition, more so an ethical situation that directly affects living standards of affected populations or society. It also overlooks economic benefits like social protection, fiscal policy, and governmental legitimacy as enumeration and counting is an important constituent of socioeconomic scaffolding. This very review examines the issue of invisibility at the point where there are unavoidable intersections of epistemic boundaries of traditional statistical categories, modern institutional practice, and historical legacies of enumeration. By also recognizing invisibility as a result of particular infeasible measuring regimes, political incentives, and social arrangements, the study aims to reach beyond diagnostic claims that the uncounted are simply "hard to reach" and establish a balanced overview of the socioeconomic situation ^[1-4].

One of the vital insights into understanding the structural problems of statistical invisibility is to reckon that it is a multifaceted concept when seen from the West African perspective. This multi-level problem has three core anchor points: demographic invisibility (people not included in vital statistics and civil registration systems), then secondly, economic invisibility (value-creating activities and activities that are not formally measured), and lastly, geographical invisibility (markets and communities that are not included on administrative maps). Each of these three dimensions influences, as effectively as others, the economics of inclusion, more devastatingly, also jeopardises the merit, hence the accuracy and reliability of data values of key national measures like GDP composition, poverty and unemployment data. On the one hand, counting establishes for a state a type of certainty of legal and financial presence. On the other hand, having a large undocumented population often translates to creating exclusion on policy affairs and position often resulting in a denial of rights. This establishes enumeration as not only a technical business but one that is political and ethical all at once ^[1, 3, 5].

In the ensuing subsections of this review, two important assumptions are made. To have a solid grasp on the importance of effective enumeration as an indispensable tool of socioeconomic statecraftness, it is necessary to first challenge the theory that asserts that measurement equals legitimacy, sometimes known as the "ideology of measurement." Furthermore, it is also necessary to painstakingly examine the apparent paradox in West Africa, which is that digital data expansion and enduring black holes in statistics coexist, what the review refers to as the "paradox of progress." This is because technological efficiency alone does not equate to an inclusive bias-free representation without accompanying organizational redesign and educational adjustment ^[4, 6].

1.1 The Ideology of Measurement

The dependence of the modern world on counting is predicated on the idea that an impartial enumeration atmosphere provides balanced foundations for governance. This notion is historically contingent, according to scholarly critiques, as enumeration practices in many places in the world since the dawn of modern civilization have often been tools of autocracy and control. The attempt to group together multifaceted social situations into administratively comprehensible categories that serve governance goals rather than the realities of society ^[1]. For instance, data classification frameworks like household units, taxable residents, and labor categories are classificatory templates are operational remains of colonial rule and early postmodern enumeration efforts in West Africa. In many West African states, these templates are still widely adopted even though empirically primitive, as data analytic templates. There are two repercussions. First, other data categories such as seasonal labor, reciprocal exchange and multi-site home economies are statistically marginalized because these templates systematically favor forms of economic activity that are often formal, commercialized, and temporally regular activities. Secondly, it leads to the flattening or complete non-indulgence with nuanced socioeconomic situations. Hence, political decisions that are predicated on rigid category design such as who counts as employed, economically active subjects, household head and business are hidden by technocratic setups like this that views social indicators as

neutral ^[1, 2].

The implication of this is a normative conclusion: the counting process when applied this way has no apolitical nature. The choice regarding what kind of data is worthy of being counted and the modalities of the process has an overbearing impact on vulnerability visibility and distributive results as defective enumerative processes have a potential to give rise to exclusion. Consequently, disadvantaged populations are at risk of being systematically left out of social programs and fiscal measures if legislative bodies employ inadequate or category-biased information to sort data. The first steps to addressing the problem of invisibility is to critically examine the enumeration ideology in practice and also an awareness of the power dynamics ingrained in conventional statistical procedures ^[3, 5].

1.2 The Paradox of Progress

Africa's potential to generate data has grown exponentially in recent decades due to factors such as GPS imaging and digital transactions. It is also noteworthy to acknowledge the impact and utility of mobile telephony as well as donor-funded survey initiatives. These data collection methods have no doubt increased the amount of information available thereby providing outlets to which bias-free enumeration and data handling can be done. Ironically, the gaps in statistical representation in West Africa have persisted over the years even in the presence of technological advancements like this. The data infrastructure in West Africa remains ineffective for a number of reasons. First, there is a challenge of access and interoperability which can be ascribed to the fact that on the sovereignty side, technology data is frequently created and managed by private companies and multinational platforms often in negligence of the domestic statistical landscape. To add to this, there is a disjunction between traditional survey methods and new inferential methods and verification processes which are often needed for different data modalities. Reconciling this has been an enormous difficulty owing to the methodological frameworks employed in traditional surveys and administrative records. Lastly, there is an administrative challenge. Institutional capacity and regulatory frameworks required to incorporate digital technologies into regular statistical operations are frequently outpaced by investments in these tools ^[4, 6].

2. Conceptual Framework: Informality, Data Epistememes, and the Construction of the Uncounted

The way cultures define and accept acceptable forms of involvement and knowledge forms provides the conceptual underpinnings of statistical obscurity in West Africa. The bulk of people in the area live in the informal sector, which is sometimes dismissed as an empirical remnant outside of formal economies. Its omission from official statistics is the result of epistemic hierarchies, which are systems of knowing that give preference to some forms of economic visibility over others, rather than just a measurement error ^[7, 8].

Three analytical lenses are used in this section to explore the idea "the uncounted." The initial consideration of informality beyond economics investigates informality as more than just an economic concept; it's a social and spatial state. Furthermore, the concept of numbers examines how institutional and historical knowledge systems influence the definition of data. Finally, the politics of categorization examines how strict classification schemes used by national statistical standards eliminate heterogeneity and enforce

legibility. Together, these viewpoints place invisibility in the center of the understanding of infrastructures supporting contemporary governance rather than on the periphery.

2.1 Informality Beyond Economics

Informality is defined by the traditional economic perspective as unregistered or ungoverned labor and manufacturing that takes place outside of official institutional authority ^[9]. However, interpersonal, socioeconomic, and political factors that support informal activities are hidden by such a description. Informality serves as a logical response to bureaucratic inefficiencies, lax enforcement of regulations, and sociocultural forms of trust-based communication in a large portion of West Africa. It represents a different kind of order rather than chaos, one that is consistent with kinfolk labor ties, community-based credit systems, and flexible business networks ^[10].

However, statistical methods frequently handle this level of detail as noise that needs to be discarded. People who work as market traders, transport operators, and subsistence farmers all at the same time are not included in surveys and censuses with strict occupational categories. As a result, the informal sector continues to be marginalized in macroeconomic planning and its effect on the economy and to job growth is undervalued ^[9, 11]. Changing the way data frameworks think about participation and production is necessary to acknowledge informality as a unique social infrastructure as opposed to a residual economic zone. This viewpoint aligns enumeration with lived experiences as opposed to theoretical formal ambitions, shifting from the assessment of deviance to the recognition of variation ^[7, 8].

2.2 The Epistemology of Numbers

An epistemology—a collection of presumptions about what qualifies as legitimate knowledge—is the foundation of every statistical endeavor. Colonial organizational demands have historically influenced these epistemologies in West Africa:

counting for executive authority, dominance, and taxes rather than for inclusion in society ^[12]. These systems' legacies are still present in contemporary data constructions that value homogeneous descriptions and conventional groups based on international statistics standards. Such standardization subordinates native understanding categories to foreign statistical principles, thereby enforcing epistemic reliance even as it facilitates cross-cultural comparison ^[13].

Furthermore, the interpretive aspect of data compilation is obscured by the idealization of statistical objectivity. Although numbers are seen as uncontested facts, they are the result of systemic logics and classificatory judgments that are fundamentally political ^[14]. For example, remote communities, nomadic communities and gendered labor patterns that do not fall into binary vocations are often excluded from survey designs. Therefore, invisibility is the eradication of cultural phenomena that do not fit into predetermined frameworks of legibility, rather than the actual lack of data. Questioning the basic epistemology that governs what is being quantified and who has the power to define it is therefore necessary to comprehend the epistemology of measurement ^[12–14].

2.3 The Politics of Categorization

In statistics, categories are both formative and descriptive; they shape reality rather than just representing it ^[15]. Categories like "household," "labor force," and "employment" are frequently imported from foreign statistical resources into West African national statistics with little contextual modification. However, these strict boundaries have no representation in the local social landscape. Extended household structures, for example, make it more difficult to understand leadership and dependency ratios, and periodic and cyclical migration trends make it difficult to distinguish between unemployment and employment ^[16].

Table 2: This table highlights the definitional disparity and heterogeneity across selected West African countries

Country	Official Economic Definition of Informality	Conceptual Focus	Data Source
Nigeria	Unregistered enterprises and self-employed workers outside formal regulation	Legal status and registration	National Bureau of Statistics (NBS)
Ghana	Employment without social protection or written contract	Labour protection criterion	Ghana Statistical Service (GSS)
Senegal	Production units not registered in the national business registry	Institutional registration	National Agency of Statistics and Demography (ANSD)
Côte d'Ivoire	Economic activities operating outside tax and regulatory frameworks	Fiscal and regulatory compliance	Institut National de la Statistique (INS)
Sierra Leone	Employment not contributing to formal social security	Social security linkage	Statistics Sierra Leone (SSL)

There are significant repercussions from this disjunction. First, the transitory variants of work and transactions that support regional economies are obscured by quantitative methods that attempt to fit complicated living conditions of many West African residents into conventional patterns. To make this worse, socioeconomic benefits and attention are directed toward sectors and actors that already have institutional visibility. This disparity exists due to the resulting data which is relied upon to conceptualize and effect macroeconomic models and policy recommendations, thereby perpetuating formal bias. As a result, classification in the data environment is often a political tool of exclusion, as such narrow enumeration standards impartially put forward who is acknowledged by the government and who is not ^{[15–}

^{17]}. Therefore, the problem of statistical invisibility in West Africa, a necessary call for revolutionary methodology and categorical reform must be made. This would involve critical and intentional reframing of statistical terminology to capture correctly, the broader socioeconomic frameworks it is intended to monitor.

3. Historical Foundations: Colonial Enumeration and the Inheritance of Exclusion

The colonial project is intricately linked to the statistical underpinnings of modern West African republics. Colonial governments created computation and documentation methods decades before national statistical bureaus were established with the objective to further imperial goals,

chiefly administrative order, labor control, and taxes. These systems were created to make colonial communities readable for the sake of government and extraction, not to accurately depict them ^[18]. The postcolonial record keeping facilities in the area have significant structural remnants from the transmission of such enumeration logics.

The historical heritage of statistical invisibility is examined in this section. It attempts to make the inevitable case that the modern challenges such as government trust, coverage, and classification are not only technical in nature but also historically shaped by political and conceptual constants. The study here draws a recursive to the development of counting from colonial to contemporary times through three subsections: the absence of the everyday, the influence of colonialism in postcolonial counting, and enumeration as control. Each section demonstrates how dominance-oriented methods continue to exist, often covertly, in the structures that decide who and what is taken into account in the modern world.

3.1 Counting as Control

In West Africa, colonial enumeration developed out of a desire to control the social structure rather than out of interest in it. Tax rolls, labor registrations, and population counts served as instruments for collecting money and upholding labor laws ^[18, 19]. Under the British, French, and Portuguese governments, censuses were irregular, incomplete, and inconsistent in their methodology. They excluded dependents, women engaged in menial work, and nomadic groups, while favoring demographic composites such as masculine figures of household, taxable adults, and economically productive laborers ^[20].

An ethical and institutional stratification was created by this selective counting, whereby those who could be counted were acknowledged as productive contributors and others were made statistically anonymous. As a result, enumeration evolved into a continuation of colonial rule, serving as a tool for order and surveillance rather than social comprehension ^[21]. Spatial mapping was also influenced by this logic of control, as areas were separated into administrative divisions that mirrored missionary and extractive interests rather than natural communities. The persistent disparity between visible and unseen demographics in the geographical area's statistical systems was caused by the epistemic bias of colonial data collection, which oriented itself toward control instead of representation ^[19, 20].

3.2 The Colonial Legacy in Postcolonial Enumeration

There is no doubt that the bureaucratic models of counting in West African states today bear an influence from precolonial times of Imperial Britain. Due to their limited resources and reliance on foreign standards, many West African postcolonial administrations duplicated these inherited structures with little contextual change ^[22, 23]. Western standards of measurement were incorporated into African development planning through the wholesale importation of statistical training programs and institutional models from European metropolises. Consequently, the new statistics agencies frequently lacked epistemic confidence as well as methodological autonomy ^[24].

Additionally, postcolonial enumeration maintained the extractive ideology of its predecessor; therefore, rather than being a participatory act of representation, data collection continued to be an exercise characterized by administrative

modernity. More than a tool for producing inclusive knowledge, the annual Census evolved into a political spectacle—a theatrical assertion of legitimacy and sovereignty to foreign partners ^[25]. Therefore, the informal majority, whose livelihoods and spatial reality did not match inherited models, continued to be marginalized as enumeration continued to favor the quantifiable and the formal. The persistence of inequalities in visibility and the need for both resources and epistemic overhaul to restructure statistical capability might be explained by the continued operation among colonial and contemporary statistical frameworks ^[23–25].

4. The Informal Majority: Mapping Contemporary Forms of Statistical Absence

One thing remains true, if asymmetrical data visibility became standard practice in the colonial era, it has become an accepted and intractable system in the postcolonial era. To understand the data ecosystem of West Africa is to consider the disjoint between living methods of modern-day Nigerians and the Western counterparts. Today, one of the most persistent barriers to efficient administration and economic management in West Africa is the statistical invisibility of large portions of the population. A large number of groups are excluded owing to factors such as residency without identification, nomadic trading, and workers in informal sectors which make up a large economic group in the region. Despite significant steps made towards improvements, the region's data management structure continues to fall short in capturing the intricate nature of its demographic and economic realities within it.

The enduring nature of invisibility and what influences that in contemporary statistical systems is examined in this section. Having highlighted historical foundations of enumeration in West Africa, this section of the review lays out the ideological divide between excluded nuances and what is captured as against what exists, a socioeconomic state brought about by informality and the flawed utility of enumeration infrastructure. Beyond evaluating the institutional and operational constraints of modern enumeration, this section delves into the geopolitical aspects and resulting crisis. When treated holistically, these inquiries demonstrate that statistical fragmentation and obscurity has a structured nature and also influences the flawed perception of West Africans about their societies rather than a true reflection of technical inefficiency.

4.1 Informality as the Statistical Frontier

The main concern in West African economic infrastructure is informality. However, populations that belong here continue to be disproportionately represented in domestic data documents and labor statistics, which is a serious burden of concern as the informal labour sector makes up around 65–80% of all employment types in the region ^[29, 30]. Conventional methodologies for surveys which often are built around static settlements or modeled around formal firms are ineffective in capturing the mobility, and pluralistic nature of the sector leading to inadequate registration of nontraditional employees inside state systems.

Furthermore, statistical exclusion of this population comes with exclusion of income data and productivity level as well as employment patterns. This also means that cash-based transactions evade fiscal and administrative records. More so,

informal marketplaces operate with little or no documentation [31]. Furthermore, by West African governments treating informal economy as a statistical residual instead of as a substantive area of investigation, residual estimate approaches frequently surmise rather than quantify the fiscal significance of informal activities. By obscuring distributive mechanics of informal economy this strategy distorts the broader economic narrative [32].

Consequently, it is then imperative to recognize informal-working populations as both a socioeconomic category and a statistical frontier, effectively representing a region where the boundaries of the state's empirical perspective are revealed by the boundaries of enumeration. To this end, a deeper institutional decision about what should be enumerated is reflected in the lack of reliable data on the informal economy, in addition to methodological issues.

Table 2: Illustrates the degree of informality that exists across key West African economies, illustrating the continued disparity between economic contribution and statistical recognition [29–33].

Country	Estimated Informal Employment (% of Total)	Informal GDP Share (%)	Main Data Sources
Nigeria	82%	57%	ILO (2021); NBS (2020)
Ghana	76%	48%	Ghana Statistical Service (2020)
Senegal	79%	52%	ANSD (2020)
Côte d'Ivoire	70%	45%	INS (2020)
Sierra Leone	84%	61%	Stats SL (2020)

4.2. Fragmented Infrastructures and Institutional Gaps

The problem of data invisibility is further compounded by the reliance on a certain kind of data collection of which an example is donor-driven surveys [33]. Donor surveys, while notable for valuable statistical insights, fall short as a primary statistical tool in many West African social conditions. It also prioritizes thematic agendas aligned with international development frameworks rather than domestic policy needs [36, 34]. The result of operating West African social conditions under this module is that a form of statistical dependency is created at a national scale, wherein local data systems mirror

the epistemic priorities of foreign states. The impact of this dependence is that it diminishes the autonomy of national statistical offices driving lack of innovation or redefining in their measurement paradigms as times evolve. As a result, institutional gaps are both epistemological and infrastructural: a lack of clarity regarding the purpose, audience, and identity of data collection. Thus, a more fundamental problem of governance is reflected in a statistical oversight crisis, in which representation is facilitated by dissimilar bureaucracies, bequeathed colonial paradigms of classification, and external funding [34–36].

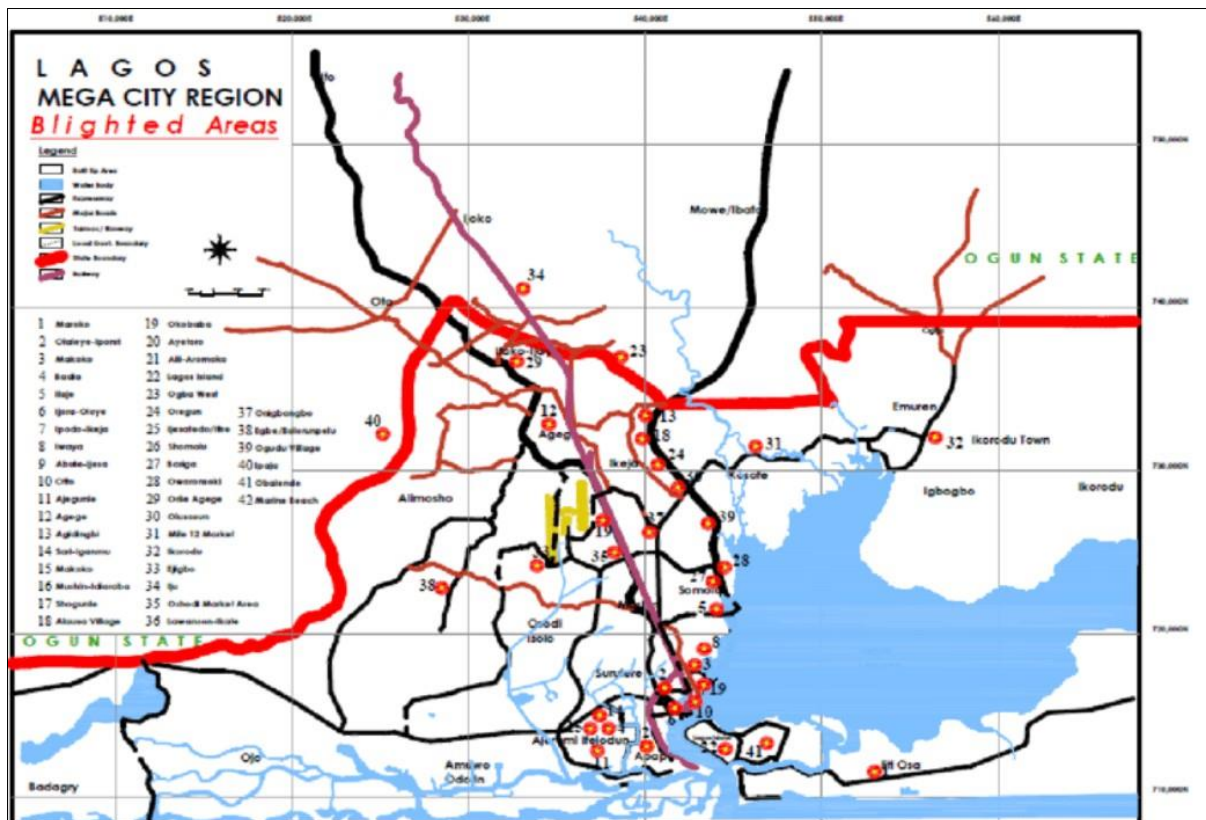


Fig 1: Locations of informal settlements in Lagos, West Africa

4.3. The Digital Divide and the New Data Economy

Digital technologies have created new inequalities of visibility while also increasing the possibility of real-time data acquisition. Digital transaction data and smartphone

penetration have emerged as new sources of economic and social analytics in West Africa. However, individuals without consistent digital footprints—especially rural women, travelers, and small-scale traders—are not included in these

sources, which substantially portray the connected urban population [38]. Data from the private sector, such e-commerce activities and mobile finance records, now make up enormous databases of

behavioral information. However, a new type of data containment has been created because companies, rather than public statistics systems, own and control these datasets [39].

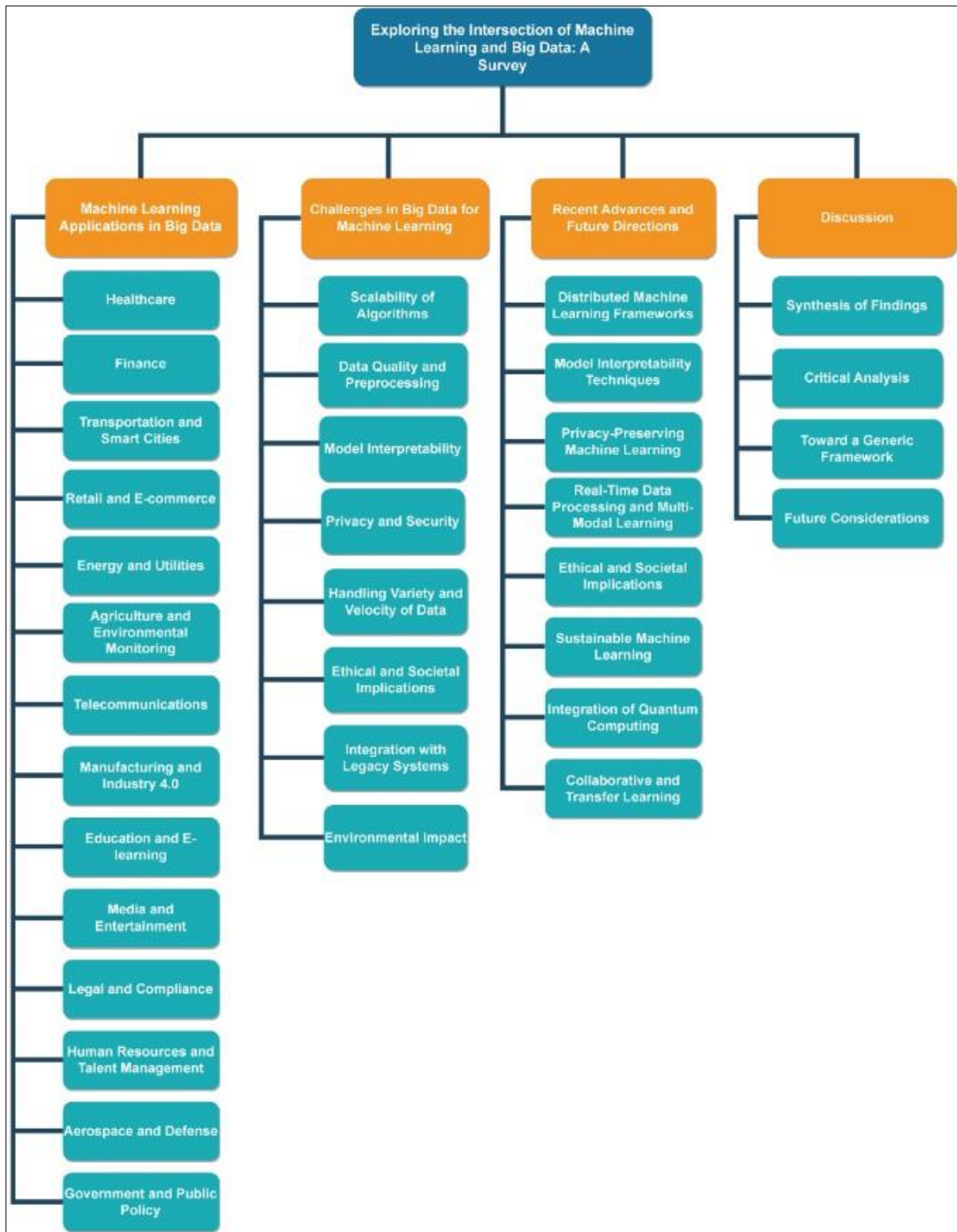


Fig 2: An illustration of machine learning and big data [18]

5. Toward a Data Renaissance: Modern Data Science and the Reimagining of Visibility

The burgeoning field of data analytics offers a chance to redefine enumeration if its past in West Africa is one of exclusion. The epistemic structures derived from colonial and

postcolonial computation are starting to be challenged by recent developments in computer analytics, remote sensing, and interactive data systems. However, how these advancements are used will determine whether they strengthen outdated invisibility hierarchies or usher in a more

diverse regime of knowledge.

The ways that contemporary data science may rethink responsibility, inclusivity, and visibility in West African statistical structures are examined in this section. It assesses existing experimental procedures, points out moral and practical issues, and develops a paradigm for data justice based on local conditions.

5.1. Data Science and the Recovery of the Invisible

New mechanisms for portraying groups that have previously not been included in official records are brought about by data science. Alternative resources for data including satellite photography, payment records, and cellular device file metadata can be used by machine neural networks and spatial analytics programs to deduce demographic and economic trends^[41]. For example, in undercounted areas, satellite imagery of high resolution frequently outperforms classical surveys in precision when used to predict poverty and settlement concentration in Nigeria, Ghana, and Mali^[42].

But this new empiricism represents a paradigm shift from extractive enumeration to inferential visibility, and it is more than just technical. Instead of simplifying variation, data science provides the ability to accurately represent it by going beyond polls of households and census data. Algorithms developed on Foreign datasets may repeat statistical imperialism by incorporating biases that inaccurately represent African cultural and economic situations, therefore these models need to be contextualized^[43].

In addition to implementing new technologies, a West African data revolution necessitates the creation of locally curated and managed indigenous databases. A significant epistemic rearrangement would occur with this shift from acquired methods to domestically placed data science, changing the statistical imagination of human reality.

5.2. Participatory and Community-Driven Data Collection

Along with a need for upgrading of computing resources and data infrastructure, community-based data networks represent a second area in need of improvement in many West African states. In a number of West African cities, including Lagos, Freetown, Dakar, and Accra, community-based groups have started collaborative mapping operations which record social facilities, economic activity, and low-income neighborhoods^[45]. These initiatives are important in that they flip the traditional data organizational structure, making citizens producers rather than subjects of data. Furthermore, Participatory research enumeration not only fills empirical gaps as shown by previous studies, but also challenges the epistemic assumptions that underlie official statistics. Hence, by reorienting data collection to local knowledge systems, these practices generate contextually rich, ethically responsive data^[46] and give populations that have historically been treated as statistical objects a sense of agency.

When rethinking mechanisms for governance it is necessary to institutionalize inclusive data as a paradigm. To this end, statistical agencies must evolve their operation from closed bureaucracies into collaborative platforms and open data systems. This might entail the establishment of collaboratively created electronic dashboards along with free GPS data repositories within which authorities, scholars, and citizens come together in an ongoing feedback loop for data use alongside authentication^[47].

5.3. Ethics, Data Sovereignty, and the Question of Justice

Data science advancements in West Africa, notwithstanding their potential, bring up pressing issues of sovereignty, permission, and rights. The possibility of "data extractivism," the practice in which domestic data is obtained, interpreted, and reconstituted as socioeconomic ideas sold once more to the local population, is increasing as foreign technology companies and international organizations control the electronic data infrastructure^[49].

This is similar to colonial statistics' previous epistemic reliance, which has been recoded in digital form. Thus, the question of sovereignty arises in the political economy of data science: who owns the servers, who creates the algorithms, and who determines the value of the data?

In order to guarantee that data infrastructures continue to be public goods, integrated into local institutions, and answerable to the public, a regional plan for data fairness must specify organizing principles^[50].

Additionally, representational justice must be addressed in ethical design. The algorithmic marginalization of populations that are underrepresented by predictive models might intensify social bias. Emerging safeguards against these digital injustices include public algorithm databases, ethical privacy oversight boards, and comprehensive auditing systems^[51]. In addition to data collection, moral architecture—statistical representation in West Africa must be sovereign, democratic, and equitable—is essential to its future.

7. Conclusion: Rethinking Enumeration as Justice

In modern West Africa, the story of visibility remains inextricably linked to the politics of counting. What started out as a tool of colonial order developed into a postmodern framework that nonetheless prioritized publicity over reality and rigidity over existence. Historical in nature, the data omissions that currently plague the region's economic growth narratives are ingrained in the very systems and epistemes that purport to characterize society. Therefore, changing the moral reasoning behind enumeration itself is more difficult than just gathering additional data. Visibility has to develop into an ethical obligation rather than a result from executive convenience or technology availability.

In this updated definition, counting means acknowledging—affirming that every existence, unofficial business, and unrecorded settlement is part of the state's statistical imagination. Digital infrastructures, participatory mapping, and modern data science present an opportunity to fulfill that pledge, but only if they are applied with fairness, context, and sovereignty. Dismantling epistemic dependency and fostering indigenous systems of knowing—where local institutions govern both data collection and data meaning—are essential to the future of enumeration in West Africa.

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Digital facilities, inclusive mapping, and contemporary data science present an opportunity to fulfill that pledge, but only if they are applied with fairness, context, and sovereignty. Deconstructing epistemic reliance and fostering native systems of cognition—in which local institutions govern both data collection and data meaning—are essential to the evolution of enumeration in West Africa.

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