

Understanding the Impediments to the Harmonization of Disparate Digital Identity Schemes in Africa: The Case of Nigeria

Elvis Otsemehuno Ogah

Abstract:- This Research aims to understand the impediments to harmonization of disparate identity schemes in Africa from the Nigerian lens. A mixed method was adopted for data generation. Content analysis of secondary data from journals, books, reports, magazines, internet and other archival resources were explored extensively. For primary data, in-depth interviews were conducted to harvest thoughts of key stakeholders with a view to solidifying the empirical aspect of the work. In order to induce clarity, key concepts related to identity management such as Digital Identity, Interoperability and Harmonization were expounded upon. The study brings to fore the current disorder in the Nigerian identity ecosystem and the legal, organizational and technological impediments to harmonization of disparate identity schemes in the country. To foster an orderly development of an identity environment that would drive e-governance and support a local digital economy, the study recommends that, rather than migrating all existing data into a single national repository, all existing databases in the country, be they foundational or functional, be updated with a unique identifier called the NIN which will serve as the common denominator across all databases.

I. INTRODUCTION

The study of digital identity as a key enabler to expanding the frontiers of African economies, has always been a fascinating blend of different fields, requiring a combination of knowledge, critical thinking and fast reflexes to really succeed in. One can hardly point to anything that is as pivotal to mankind as identity. Our identity is, quite factually, who we are: a mishmash of physical attributes, personal history, innate and learnt beliefs and behaviors, and a bundle of cultural, family, national, team, gender or other identities.¹

Africa in the past ten years have witnessed an increasingly sophisticated use of personal information, exploiting ICT to deliver a variety of services, and to drive and achieve different goals. Identity systems are rapidly changing how Africans live, work and prosper. As the digital age evolves, citizens expect to be able to access government services with relative ease. Furthermore, the onus is on governments to meet the highest standards of service delivery; data protection, privacy and security; to offer a wide choice in accessing services, and to account for diverse needs.

One can hardly point to a lone factor that affects an individual's ability to partake in the dividends of national development as much as possessing a formal identity. Identity unravels a potpourri of services ranging from voting, bank account ownership, credit applications, company registration, land deeds, social safety payments, and school admission.

Robust identity systems can checkmate a litany of the malady that appears to be bedeviling Africa such as insurgency, trafficking in persons, and child marriage amongst others. ID has moved far beyond just a physical card with a name and photograph; they are increasingly being digitalized, and stands as the nexus between the power and prerogatives of government and the entitlement and necessities of citizens. Digital ID create a foundation of trust and inclusion that reinforces the expansion of economies, propels financial inclusion, drives service provision, and promotes continental free trade. They can also be used by repressive regimes to exclude or subjugate.

In Nigeria, ID systems are built with a focus on standalone schemes, not as a holistic development infrastructure significant for a digital age. This has led to inept use of scarce resources and has frustrated national governments and international donor agencies alike to miss opportunities to make more impactful, sustainable and transformative interventions.²

As technological change is quickening, it makes the political and social context around ID systems increasingly complex, especially as it bothers on interoperability of systems and harmonization of data. Thus, the need for clearer understanding on data harmonization and an informed engagement around ID systems and technologies has never been greater. How these emerging trends, especially interoperability cum harmonization which this study majorly concerns itself with are efficiently addressed will define whether digital identification is an apparatus of empowerment and inclusion or surveillance, disempowerment, and exclusion in Africa.

This entire research work runs into five sections. The first introduces the work and brings out its objectives. It also include the problem statement, research questions and significance of study. Section two attempts a conceptual clarification on Digital Identity, Data Harmonization and Interoperability of identity systems. The third section presents, albeit concisely, a historical overview of Nigeria's

identity data harmonization trajectory. The legal, organizational and technological impediments to the harmonization of identity schemes in Nigeria are discussed in section four while appropriate policy options are identified and proffered in the last section.

1.1 STATEMENT OF THE PROBLEM

The relentless push towards a data-driven Africa has deepened a crucial problem within its identity sphere. Nigeria in particular, being the most populous nation in the continent with 200 million people according to United Nations data,³ has witnessed over the last decade, a progressively sophisticated use of personal information leveraging ICT for diverse service provision, and to drive and accomplish different goals. This reality has thrown up to the fore some of the pitfalls that have led to fragmentation, and contrasting standards.

For example, there are over 14 Government Agencies in Nigeria that collect biometric data, along with other corporate entities, with each managing its own database. Most individuals give their basic information to these organizations during their lives, leading to a scenario where they now have different versions of themselves. Databases of these agencies are largely monolithic, established and deployed for a distinct purpose only, functioning within their own isolated domain and legal powers.

Such lack of a harmonized digital identity environment has therefore occasioned a situation where individuals now have a host of mismatched digital identities in order to access the services which they seek. Since each identity can only be used in a specific context and common recognition of verification tokens between them is far from standard practice, criminals now exploit this disconnect to perpetuate all forms of attacks. This situation has proven difficult to address because these ID systems typically do not communicate. They operate in silos which further leads to higher costs, inefficiencies and friction.

In a similar vein, it is imperative to consider the security and privacy implications of stand-alone and interoperable systems alike. With systems serving varied purposes, requiring diverse identity assurance levels and data, and their architecture being influenced by sundry technical, legal, cultural and institutional frameworks, it is ostensibly evident that a universal, centralized repository identity solution may continuously prove elusive. What is inescapable however, is the need for harmonization of shared principles and standards guiding the design and implementation of ID systems.

Enhancing interoperability between systems could address these challenges and enhance the individual's experience. However, in spite of efforts to harmonize these disparate ID systems in Nigeria over the last ten years, results have been dismal; harmonization has still not been achieved. This study therefore investigate impediments to achieving a harmonized digital identity ecosystem in Africa using Nigeria with the largest identity scheme tagged

National Identity Management System (NIMS) in the continent, as a case study.

1.2 RESEARCH QUESTIONS

1. What is Digital Identity and why is it significant?
2. What is Data Harmonization and how can it possibly address the proliferation of Identity schemes in Nigeria?
3. What are the Legal, Organizational and Legal Impediments to Harmonization in Nigeria?

1.3 SIGNIFICANCE OF THE STUDY

1. The study is important as it attempts to identify the key challenging technical, organizational and legal impediments to the harmonization of Nigeria's identity schemes.
2. The study adds to a deeper understanding of the barriers, opportunities and threats in overcoming the proliferation of identity schemes whilst also raising consciousness and promoting an elevated understanding of the e-ID research and policy ecosystem in Africa.
3. This study is important as it shall propose policy options to solving the problems of disparate identity schemes in Nigeria.

II. CONCEPTUAL CLARIFICATION

2.1 Defining Digital Identity, Harmonization and Interoperability

2.1.1 Digital Identity

As Identity systems evolve, nations are increasingly moving away from paper-based and plastic identity cards whilst embracing digital identity. Digital Identity is a collection of electronically captured and stored identity attributes that uniquely describe a person within a given context and is used for electronic transactions.⁴ Rosario, Pérez and Sánchez are of the opinion that generically, a digital identity is a virtual representation enabling the user to interact in cyberspace, to project a personality and to describe a personal or professional trajectory, in order to learn and share information, such as news, Websites, hobbies, opinions, etc.⁵

More specifically however, Amenta, Lazzaroni and Abba defined Digital identity as the data that uniquely describes a person or a thing and contains information about the subject's relationships.⁶ Digital identities have evolved. They are no longer simple and isolated pieces of information about individuals, but complex webs, crossing the internet, of their personal data, digital history and the inferences that algorithms can draw from this. Our digital identities are increasingly embedded in everything we do in our daily lives.⁷

Digital Identity provides remote assurance that the person is who they purport to be. A digital identification system refers to the systems and processes that manage the lifecycle of individual digital identities.⁸ It may be composed of a variety of attributes, including biographic and biometric data as well as other attributes that are more broadly related to what the person does or something

someone else knows about the individual. When these data are collected and verified, they can be used to identify a person by answering the question “who are you?”⁹. As Hernaes points out, ‘your digital identity is more than your login credentials as it is the authentication that connects you with the digital you. Your digital identity consists of thousands of data points that make up a profile of who you are and your preferences’.¹⁰

Rouse defines Digital Identity as the body of information about an individual, organization or electronic device that exists online.¹¹ Furthermore, he posits that ‘unique identifiers and use patterns make it possible to detect individuals or their devices. This information is often used by website owners and advertisers to identify and track users for personalization and to serve them targeted content and advertising . A digital identity arises organically from the use of personal information on the web and from the shadow data created by the individual’s actions online. A digital identity may be a pseudonymous profile linked to the device’s IP address, for example, or a randomly-generated unique ID. Digital identities are seen as contextual in nature since a user gives selective information when providing authentication information’.¹²

Digital ID is seen as a digital representation of a set of claims made by one party about itself or another digital subject.¹³ Sadiku, Shadare and Musa view digital identity or electronic identity (e-ID) as follows: the digital representation of the information on a person, organization or object. It is the computer network equivalent to the real identity of a person or entity. It is information about a person, organization, or device used by computer networks to represent us. This information can be used for many purposes such as proving one’s identity.¹⁴ They further highlighted some of the challenges faced by digital identity to include ‘privacy, security, identity theft, and interoperability’.¹⁵ It is imperative thus, to expound on the issue of interoperability of systems given that it is a related entity to harmonization of identity data which is the crux of this study.

2.1.2 Interoperability

Interoperability is the ability of two and more systems or components to exchange information and to use information that has been exchanged.¹⁶ Gasser and Palfrey however argue that ‘there is hardly a uniform or generally acceptable definition of interoperability in ICT.’¹⁷ While broader frameworks they submit on the other end distinguish and define interoperability very broadly and at various levels, including, for instance, legal and political layers, the analysis of many definitions along this spectrum leads to the conclusion that interoperability is a very context-specific concept.¹⁸

Digital ID interoperability is ‘a constantly shifting interconnection among ID users, ID providers, and ID consumers that permits the transmission of Digital ID information between them via a secure, privacy-protected channel’.¹⁹ For Digital ID users, Gasser and Palfrey conclude that interoperability concretely means being able

to sign into one program or web site and having an individual’s information seamlessly and securely transferred as needed to a variety of merchants and service providers.²⁰

Interoperability is conceived as the ability of emergency responders and identity data collectors to work seamlessly with other systems or products without any special effort.²¹ Interoperability of computer and information technology systems is characterized by network protocols, interfaces between operating systems, the platform independence of applications and the communicability of records and fields. It is the technical support arrangements connecting organizations and often requires formally codified standards.²²

Digital identity Interoperability occurs when a digital identity issued by one organization, is recognized by other entities and it is facilitated by a common language to represent all attributes of digital identity (such as Security Assertion Mark-up Language (SAML) from OASIS – Organization for the Advancement of Structured Information Standards) and a transparent standard hierarchy. While Interoperability pertains to communication between systems, harmonization borders on pulling various identity schemes together.²³

Moen provides a similar but richer definition seeing it as ‘the ability of different types of computers, networks, operating systems, and applications, to exchange information in a useful and meaningful manner.’²⁴ A major challenge regarding harmonization in the Nigerian context is the requirement for Interoperable identity management policies and standards.²⁵

2.1.2 Harmonization

Harmonization is a term that has received a lot of attention recently because of the current fragmentation in the African identity ecosystems.²⁶ It is therefore of necessity that this buzzword be deconstructed for clarity purposes. ‘An identity ecosystem is said to be harmonized if two conditions are satisfied. First the identity of a real person is unique and is linkable across all identity databases, assuming legal authority and privacy protections are in place’.²⁷

Identity data harmonization is the process of combining multiple data sources into an integrated, unambiguous entity “golden copy” record that can be used by consuming systems to feed a business process.²⁸ Harmonization of Digital Identity schemes aim to bring disparate, multiple registries together in a cost-effective and sustainable manner. However, linking these individual systems to exchange, consult or update data represents a considerable task - from a legal, organizational and technical perspective.²⁹

Data Harmonization is all about creating a single source of truth. It does this by taking data from disparate sources, clearing away any misleading or inaccurate items, and presenting it as a whole. This means you get a single window view of everything and anything that supports

ongoing decision-making, including financial information and business performance. Data is coming at you from different sources, but once it's harmonized, it's been cleaned, sorted, and aggregated to provide a complete picture.³⁰

Harmonization of disparate identity schemes aims to find the right balance, leading to efficient and effective business processes.³¹ The advantages are crystal clear; they range from improving the efficiency, decreasing operating costs, increasing internal control, to facilitating the interoperability between different agencies with a uniform user of IT systems.³² Data Harmonization process begins with defining organizational goals and objectives. Harmonization and research protocols are consequently established that support these objectives. An equipped architecture for the IT systems and elements required are then designed to start the data integration and harmonization process.³³

Benefits to harmonization, include the (a) enhancement of the quality and utility of business data by making it relevant to the needs. (b) Data Harmonization also makes it possible for business users to transform data and create new data analyses and visualizations without IT involvement. (c) You don't have to wonder if you're getting the whole picture as you can completely rely on the truth of your data and make stronger decisions.³⁴

In the case of Nigeria, the interoperability needed for creating a harmonized ID ecosystem is often hindered by the diversity of isolated databases like the scenario where no less than 14 government agencies capture biometric data, and also own and operate distinct repositories.³⁵ These agencies have their own data format, API, access procedures, and database design. Even more puzzling, is the fact that 'some records by some agencies are still being held largely in paper-based registers'.³⁶

This lack of cohesion, is the direct result of non-compliance to available technical standards for data exchange among databases which has impeded the development of ID ecosystems in Nigeria.³⁷ With no compliance to standardized way to connect registries, identity system vendors often develop their own ad hoc API interfaces which are tailored to an individual register and based on proprietary technology which further create vendor 'lock-in' scenarios that potentially leave governments with limited options should they need to evolve their ID ecosystems.

And in the case of Nigeria, the Government had to build its National Identity Management System (NIMS) from scratch beginning from 2007 and abandon its existing civic registry legacy investments.³⁸

III. NIGERIA'S IDENTITY DATA HARMONIZATION ROLLOUT: A HISTORICAL OVERVIEW.

Since the 1960s, the Nigerian government has thought it wise to establish a National Identity System for its citizens and those who are legally residing in the country.³⁹ A big step was taken in 1978 which saw the creation of the Department of National Civic Registration (DNCR). The DNCR has as its mandate to registrar and issue of a National Identity Card to every citizen of Nigeria aged 18 and above.⁴⁰

The main objective for the Government was to create a system of national identity card issuance with hopes that it would help sort out the growing problems about the correct identity of individuals, serve as an effective tool for controlling illegal immigration, provide a basis for reliably validating other civic documents like driver's license, travel passports, etc.⁴¹

Two important objectives of identity management were however not achieved. One is the harmonization of identity-related databases in government agencies and, two is the development of an identity management system for Nigeria. There was also, no provision for an effective means of information update and no access infrastructure at all to enable identity authentication and verification which in part informed Government's decision to review the various identification schemes in Nigeria.⁴²

In 2005 the Federal Government of Nigeria constituted a high-level Committee to advise it on how various government (and private sector) initiatives on identification systems can be harmonized, in view of the limited benefits of its Identity Card personalization capability. The Committee, amongst other things, proposed a national policy and institutional framework for a national identity management system for the country.⁴³

The policy included the establishment of the National Identity Management Commission (NIMC), as the primary legal, institutional, supervisory, and regulatory framework to drive the reform initiative in the identity sector. To effect this policy, NIMC Act No. 23 of 2007, which repealed the DNCR establishment Act of 1978 and established NIMC, was enacted.⁴⁴

The 2005 Committee set up by Government noted that various Government Agencies and publicly funded institutions maintain disparate identity databases. Even though they go through similar processes to collect these identity data, there exists no linkage between these agencies in accessing or exchanging such related data. In some of these institutions, the process of data collection, treatment and storage is not automated, while in others, though semi or fully automated it does not provide for any form of consolidation and security protocol as to confer any integrity and or foster any reliance on the database.⁴⁵

In 2010 the federal government of Nigeria inaugurated a Harmonization and Integration Implementation Committee (HIIC) with the principal mandate to harmonize existing

identification schemes which are compatible with the National Identity Database leveraging a unique identifier called National Identification Number (NIN) as an enabler.⁴⁶

Table 1.0: Stakeholders of Identity Ecosystem in Nigeria

S/No.	AGENCY	DATABASE	REMARK
<i>Foundational ID: A foundational ID helps explain “who you are.” Two government agencies are involved in Nigeria for foundational ID.</i>			
1.	National Population Commission	Census, Birth/Death Registry	Lead agency for registering births and deaths in Nigeria,
2.	National Identity Management Commission (NIMC).	National Identity Database (NIDB).	Regulates matters of national ID in Nigeria with services covering enrolment, NIN and card issuance, ID verification and data harmonization.
<i>Functional ID: A functional ID helps explain “whether you are eligible for a specific benefit.” Several government agencies are involved in Nigeria for functional ID.</i>			
3.	National Health Insurance Scheme (NHIS).	Health Insurance Number	Operates a registry of people who subscribe to health insurance.
4.	Independent National Electoral Commission (INEC).	Voters Register	Operates a registry of people who are eligible to vote.
5.	National Pension Commission (PENCOM).	Pension Numbers/Administration	Operates a registry of people entitled to pension by the Federal Government of Nigeria.
6.	Federal Inland Revenue Service (FIRS).	Tax Payers Database (UTIN)	Operates a registry of people for taxation.
7.	Nigeria Communication Commission (NCC).	SIM Card Register	Operates a registry of mobile phone users.
8.	Joint Tax Board (JTB)	Tax and Tariff Codes	Operates a registry of people for excise and custom duties.
9.	Corporate Affairs Commission (CAC).	Business Registration Numbers	Maintain companies’ registry and offices in all the states of the Federation.
10.	Central Bank of Nigeria (CBN)	Bank Verification Numbers (BVN)	Operates a registry of people who use banking services.
11.	National Social Safety Net Project (NASSP)	Poorest Citizens Registry	Operates a registry of poor and vulnerable people in Nigeria.
12.	Federal Ministry of Agriculture and Rural Development.	-	Operates a registry of farmers entitled to agriculture benefits.
<i>Security agencies: Security agencies rely on ID to carry out security services in Nigeria.</i>			
13.	Nigeria Immigration Service (NIS)	International e-Passports	Operates a registry of people with a valid passport.
14.	Federal Road Safety Commission (FRSC)	Drivers Licenses	Operates a registry of drivers
15.	The Nigerian Police Force (NPF)	Criminal Database	Operates a registry of people in conflict with the law.
16.	Nigerian Prison Services (NPS)	Prisoners Database	Operates a registry of prisoners, both past and present.
17.	Ministry of Defense (MoD)	Security Database	Responsible for national security of Nigeria.

Source: World Bank, RDDIN (2017)

Table 1 shows federal government agencies with representatives on the Harmonization and Integration Implementation Committee (HIIC). Since the harmonization effort began in 2010, it is safe to say that some modest achievements have been recorded. These include the development of Biometric Standards; Demographic Standards; Harmonization and Integration Framework; Interoperability Standards and Card Applets.⁴⁷

However, according to Aziz ‘efforts to harmonize the various biometric identity databases in Nigeria has proven to be herculean owing to several reasons. Harmonization with Bank Verification Number (BVN) is still ongoing with only about 14 million records processed and linked with the NIN already’. After many years of relentless efforts to harmonize the silos of identity schemes scattered across the country, the results have not reached the level expected.⁴⁸

❖ **Harmonization of Identity Schemes in Nigeria: Prospects and Consequences.**

Nigeria faces an urgent need to harmonize its disparate identity schemes, remove duplicate identities, and achieve universal coverage using a unique identifier called the National Identification Number (NIN) being issued by the NIMC.⁴⁹ The NIN consists of 11 non-intelligible numbers randomly chosen and assigned to an individual at the completion of enrolment into the National Identity Database (NIDB). It is used to tie all records about an individual in the database and is also used to establish or verify his/her identity.⁵⁰

There has been a spike in the proliferations of identity schemes in Nigeria (see Table.1.0), though these schemes undergo nearly similar processes to collect identity data, these programs are not linked.⁵¹

Consequences for not having a harmonized identity registries have been, but not limited to the following:⁵²

1. Massive Exclusions: Social benefits and the Poor, Socio-economic Planning, Claim of entitlements, Basic rights,
2. Undeveloped sectors (Financial, Industrial, Agricultural etc.): Credit Bureau, Consumer Credit, Mortgage and other sectors, Financial Inclusion.
3. Security Issues: Physical: Law and Order, Business Environment, Multiple/ghost/duplicate identities, Frauds: Identity related Frauds & Scam, Terrorism & Militancy.
4. Duplication of Systems/efforts: Huge investment/infrastructure Cost, High operational cost, Maintenance of multiple & costly silos ID databases, Creation of Idle Assets.

A coordinated approach for digital identity and a harmonized databases offers the following prospects:⁵³

1. Reduced cost of ownership: Biometrics data capture & AFIS costs are eliminated; shared cost
2. Reduced expenditure by Government
3. Improved National Security
4. Single source of truth
5. Streamlined activities
6. Improved operations for agencies under the functional ID category (see table 1.0)
7. Interdependence of agencies and healthy collaboration

IV. LEGAL, ORGANIZATIONAL AND TECHNOLOGICAL IMPEDIMENTS TO THE HARMONIZATION OF IDENTITY DATA IN NIGERIA.

The impediments to harmonization of the disparate Identity schemes in Nigeria cannot be muddled up. In order to induce clarity and proffer solutions into an endeavor which has for long appear to defy solutions, compartmentalizing the problems may prove crucial. The primary strategy for avoiding the consequences and realizing the prospects of harmonization and integration revolves around a clear design, and development of a

Harmonization and Integration Policy implementation framework.⁵⁴

4.1.1 Legal Impediments

Establishment Act and Legal Provisions of Agencies: Various agencies of government that involve in biometric data capture activities and maintain silo databases have been established under a specific legislation, they include;

- The NIMC Act No. 23 of 2007
- Nigeria Immigration Act of 1963
- National Population Act No. 23 of 1989
- The National Health Insurance Scheme Act No. 35 of 1999
- The Federal Inland Revenue Service Act No. 13 of 2007
- Births and Deaths (Compulsory Registration) Act of 1953
- The Pension Reform Act of 2004
- The Electoral Act of 2010
- The Federal Road Safety Act of 2007
- The Nigerian Communications Commission Act of 2003
- The Nigerian Police Act of 1974
- The Nigerian Prison Act of 1972
- Joint Tax Board Act of 2004
- The Corporate Affairs Commission Act No. 1 of 1990
- The Economic and Financial Crimes Act No. 1 of 2004
- The Central Bank of Nigeria Act of 1958 (as amended by the 2007 Act)

NIMC which is the lead agency empowered by law to harmonize disparate Identity schemes in Nigeria has faced several gridlock due to these legislations. This is majorly due to the fact that other agencies involve in identity schemes are quick to advance a case drawing from their enabling Act as to why they should involve in data capture also. Amending these laws and getting these agencies to align their activities with that of NIMC have proven herculean over the years.⁵⁵

Non-existence of Data Protection Law:

Harmonization of identity schemes require collection and processing of personal information from one agency to another, so the protection of collected and processed data is of utmost importance.⁵⁶ In Nigeria, there currently exist no personal data and privacy laws. What exist is at best, a regulation and guidance provided in the Nigeria Data Protection Regulation (NDPR) which is not a legal instrument and cannot not be relied upon as such.⁵⁷ Nigerians need to be assured and understand the legal basis used for collection, utilization, storage, sharing and processing of personal data especially under the identity data harmonization project. Data integration and information sharing have over the years been hampered by valid and pervasive confidentiality fears by custodians of these disparate identity databases.⁵⁸ Concerns about privacy backlash that may result in the process of transferring data into a single national repository hinder seamless

harmonization amongst agencies of Government in Nigeria.⁵⁹

4.1.2 Organizational Impediments

Inter-Agency Rivalry: Harmonization of identity schemes in Nigeria has for long been truncated due to inter-agency rivalry and feelings of complex. Several government agencies hardly cooperate on issues of sharing information and that is why a lot of data integration plans fail.⁶⁰ One of the key impediments to harmonization in Nigeria is the unwillingness of MDAs to share data information and other administrative details.⁶¹ Inter-agency rivalry is born out of an unsubstantiated claim, fear or complex by agencies that feel by giving up biometric data capture of their customers and storage activities, they might lose relevance and eventually be put out of existence in the long run.⁶²

Skills and Personnel deficiency for large data processing: The Nigerian Harmonization project has had to endure a dearth of capacity especially in the area of big data processing.⁶³ In order to successfully execute a harmonization project, there must be a coterie of highly skilled personnel from both the source agency where data is being transferred from and the recipient agency that collects the data to analyze, systematically extract information from, and deal with large or complex data sets before housing into a national repository.⁶⁴ Big data and analytics are top of the global skills shortage critical list for the last four years and this is having a significant impact on all organizations, with two-thirds of IT leaders saying it is preventing them from keeping up with the pace of change.⁶⁵

Harmonization effort in the country has also suffered setbacks partly due to the inability to retain highly skilled personnel. For example, nearly 60% of those who started the project from the inauguration of the HIC in 2010 have left, either due to resignation, dissatisfaction with working conditions, retirement or better offer abroad.⁶⁶

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Inter-Agency Rivalry: Harmonization of identity schemes in Nigeria has for long been truncated due to inter-agency rivalry and feelings of complex. Several government agencies hardly cooperate on issues of sharing information and that is why a lot of data integration plans had failed in the past.⁶⁷ One of the key impediments to harmonization in Nigeria is the unwillingness of MDAs to share data information and other administrative details.⁶⁸ Inter-agency rivalry is born out of an unsubstantiated claim, fear or complex by agencies that feel by giving up biometric data capture of their customers and storage activities, they might lose relevance and eventually be put out of existence in the long run.⁶⁹

Disparity in the number of data fields captured by different agencies: Nigeria currently has one national identity program being managed by the National Identity Management Commission (NIMC), however, several functional identity programs run concurrently by various government agencies who conduct biometric enrolment of their target customers.⁷⁰ While the NIMC enrolment system

captures over 87 data fields, other agencies capture fields only to the extent to which they need to serve their customers. These differences in the number of data fields constitute a bottleneck in the quest for data harmonization and integration.

Poor quality biometrics captured by source agencies: Biometric quality is defined as an indicator of the usefulness of the biometric sample for recognition. Objective of biometrics specifications is to ensure consistent, good quality biometric images that can enable interoperability across biometric capture devices, software and unique NIN service delivery.⁷¹ But in Nigeria, it has been discovered that each agency capture biometrics according to its own defined standard, thereby leading to inconsistency.⁷² Analysis of some of the sample biometrics collected from, for instance, INEC and NCC reveal same to be fraught with environmental distortions such as noise, blur and poor illumination which falls short of the threshold required by NIMC to successfully harmonize with.⁷³

4.1.3 Technological Impediments

Data release strategy and format: The most successful case of harmonization that has been done in Nigeria was between the NIMC who are operators of the National Identity Database (NIDB) and the CBN who operates a registry of people who use banking services called Bank Verification Number (BVN). When the harmonization process between both agencies started in 2018, the initial strategy was to migrate data from CBN to NIMC across the network, that is, a server-to-server network. From 2018 to 2019, which is about a year, not more than a hundred thousand biometric records of individuals were moved while within same timeframe, five million demographics had been successfully migrated. This was a result of the disparity in capacity between the both agencies. CBN had 40gig to release BVN data and NIMC had just 4gig to receive.⁷⁴

So, to accelerate the migration, an alternate data release format had to be employed where CBN would port its data from the server into an external hard disk and then it would be transported to NIMC for onward upload into the NIDB. This alternate strategy, despite not being the best available format saw the release, conversion and cleaning of 10million BVN data in two years.⁷⁵

Non enforcement of standards in demographic and biometric data captured: There exist demographic and biometric data standards in Nigeria, however, these standards are rarely followed. Since they were developed and officially released in 2011, no less than five agencies of the government have gone ahead to launch their own identity schemes with the CBN (BVN) credited as the only agency that complied with the provisions of the standards.⁷⁶ For instance, the Biometric Standards of Nigeria (BSN) clearly stipulates that ten finger prints must be captured through the 4-4-2 format with full frontal 24bits color, well focused nose, ear and chic to crown region.⁷⁷ But this has not been the case following analysis of sample biometrics obtained from NCC, FRSC, NIS, INEC and in fact, from

every other agencies involved in biometric capture activities in Nigeria aside the CBN for Bank Verification Number.⁷⁸ This particular impediment is even more troubling as it has ushered in a scenario whereby it has become even easier and less costly to capture data afresh rather than harmonizing the data of these non-compliant agencies.⁷⁹

High volumes of records for analysis, conversion, cleansing and processing: Like it has been stated in previous sections, there has been a proliferation of Identity schemes in Nigeria. These agencies undertaking standalone ID schemes warehouse biometric records of their customers in huge volumes. For instance, INEC has 84,000,484 biometric records⁸⁰ while NCC has 198,961,361 records even though non-unique as 1 person could have 3 SIM cards registered to their name.⁸¹ Analyzing, converting, cleaning and processing these records poses a daunting task. It consumes time and demands enormous resources in terms of manpower and funding.⁸²

Volume of Records with True/False Hits: Most of the identity records in other databases already exist in the National Identity Database (NIDB). For example, when the BVN records were harmonized with the NIN, it was discovered that 62% of the migrated data were already in existence in the NIDB.⁸³ A bulk of them were consequently presented for manual adjudication process with a view to make a judgment on each dataset in a manner that is transparent, based on evidence and invulnerability. This process has proven to be overwhelming.⁸⁴

Infrastructural challenges with processing huge data (Lack of or scale up): The gamut of infrastructure requisite for the processing of huge data in Nigeria are not readily available, particularly on the side of functional identity providing agencies.⁸⁵

These infrastructure consist of the tools and agents that collect data, the software systems and physical storage facility that store it, the network that transfers it, the application environments that host the analytics, tools that analyze it and the backup or archive infrastructure that backs it up after analysis is complete.⁸⁶ Lots of these various components in Nigeria are found to be either inadequate or not readily available. Some of the most common infrastructure challenges that have been experienced includes slow network connectivity, sub-optimal data transformation and lack of scalability.⁸⁷

No central reference database for decision making: A necessary precondition for harmonization is having a critical volume of entries in the national identity database (NIDB). The larger the records in the NIDB, the greater the incentive for government agencies not to duplicate biometric enrolment, and rely on the NIDB managed by the NIMC for unique identification. The rapid scale-up of the national identity registry is thus a high priority for the timely harmonization and integration of identity schemes in Nigeria.⁸⁸ Since the commencement of its nationwide enrollment exercise in 2012, the NIMC has only been able to register 42 million citizens and legal residents into the

NIDB.⁸⁹ In a country with 208,142,673 million population,⁹⁰ more has to be done and done quickly to disincentivize other agencies from launching siloed identity schemes.⁹¹

Absence of a central ID authentication & verification service:

Under a harmonized identity system, there has to be an online real-time service that allows entities requiring verification have controlled access to the NIMC database. Government agencies that provide functional identity require the ability to biometrically verify the identity of an individual before service delivery.⁹² Two versions of this service, the web and the desktop versions, have been launched since 2014, with private vendors issued license to deploy similar solutions, these services, however, are still largely unstable to support harmonization.⁹²

V. RECOMMENDATIONS AND CONCLUSION

5.1 Recommendations

- **Establishment of a NIN Enforcement Unit (NEU):** This Unit to be situated under the Presidency and vested with full monitoring and enforcement powers with respect to the gazzeted mandatory use of the National Identification Number Regulations.
- **A full scale update project for all existing databases in the country with the NIN:** This is based on a federated system of identity databases and an uncluttered approach to identity data harmonization and integration. Under a federated schema, all databases in Nigeria, be they foundational or functional, houses distinct information. The national identity database (NIDB), which is the central repository managed by NIMC - the country's apex identity institution, keeps the data of citizens, legal residents, and eligible diasporans with individual assigned with a NIN.

The functional identity databases are at liberty to capture and hold extra details about an individual based on the services they render but as a matter of law, should have a unique identifier which in the case of Nigeria is the National Identification Number (NIN) as a shared token used to tie all records about an individual in the constituent or functional databases and is also used as a single query to establish or verify identity.

- **Enforcement of Biometrics, Demographic & Interoperability Standards:** In order to achieve interoperability of data across various government and private agencies that will use the NIN system, it is important that the capture and verification of basic demographic and biometric data for each individual be standardized across all databases.
- **Development of a robust Harmonization & Integration Framework:** Overcoming the impediments to harmonization of identity schemes in Nigeria, will require a robust framework that will facilitate the coordination of identity policies in the face of common proliferation of biometric identity schemes, helping to minimize the differences between individual

databases and contributing to a smoother transition over data into the NIDB. The framework to be imbued with mechanisms to ensure strict fiscal discipline will be important to this effort and minimizing the possibility new schemes.

- **Setting up of ad-hoc teams with specialized training and requisite technical knowhow to deal with the volume of records:** (Technical, Adjudication, and Steering Committee). There should be a redeployment of more personnel to the Harmonization sub Project and a fine-tuned strategy to retain the best hands.
- **Roll out of Authentication and Verification Services (AVS):** AVS is a core infrastructure upon which the harmonization would operate. This is based on the fact that the most common factor to all stakeholders in the harmonization platform is the requirement of a 'proven identity' to operate or function. To ensure a functional identity management in a fashion that will find general acceptance with all stakeholders and users, the Nigerian Government through the NIMC must accelerate the deployment of a ubiquitous and reliable real-time AVS service.

5.2 Conclusion

This study presents an overarching perspective on disparate identity schemes in Africa from the Nigerian lens by compartmentalizing the impediments to data harmonization. It reveals the prospect that a harmonized identity ecosystem holds ranging from reduced government expenditure, improved national security, a single source of truth to having an improved operations for functional data agencies. It also brings to the fore the chaos associated with proliferation of identity registries that are unlinked such as massive exclusions, undeveloped sectors, security issues, duplication of efforts amongst others.

The benefits of a national identity system which the Nigerian government has been pursuing since the 1960s will continue to be elusive until a full scale update project for all existing databases in the country, be they foundational or functional is executed, and a unique identifier (NIN) made the common denominator across the databases. This should be based on a federated system of identity databases and an uncluttered approach to identity data harmonization and integration.

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