IMPLEMENTATION OF A NATIONAL IDENTIFICATION SYSTEM IN GHANA: LESSONS FROM THE INDIAN AADHAAR SYSTEM

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DECLARATION

I, ERIC ESSUMAN DUODU, do hereby declare that this dissertation is the result of an original research conducted by me under the supervision of DR. DANIEL D. KIPO-SUNYEHZI and that apart from other works which have been duly acknowledged, no part of it has been submitted anywhere else for any other purpose.

…….	…….
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DEDICATION

I dedicate this thesis to my mother, Cecilia Adu (deceased) and my father Eric Duodu Acheampong for their unyielding support and encouragement. I also wish to dedicate this work to my son, Ellis Kelvin Boateng-Duodu and daughter, Kaylee Boateng-Duodu.

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LIST OF ABBREVIATIONS

BNI	-	Bureau of National Investigation
CID	-	Criminal Investigation Department
CIDR	-	Central Identity Data Repository
DVLA	-	Driver and Vehicle Licensing Authority
ECOWAS	-	Economic Community of West African States
FMRS	-	False Match Rates
FNMRS	-	False Non-Matched Rates
FTC	-	Failure to Capture
FTE	-	Failure to Enroll
ICAO	-	International Civil Aviation Organization
IS	-	Identification System
NGO	-	Non-Governmental Organization
NIA	-	National Identification Authority
NIS	-	National Identification System
NIST	-	National Institute of Standard Technology
STQC	-	Standardization Testing as Quality Certification
UID	-	Unique Identification Number
UNICEF	-	United Nations Children's Fund
INTERPOL	-	International Criminal Police Organization

TABLE OF CONTENTS

DECLARATION ..... **i**
DEDICATION ..... **ii**
ACKNOWLEDGEMENTS ..... **iii**
LIST OF ABBREVIATIONS ..... **iv**
TABLE OF CONTENTS ..... **v**
ABSTRACT ..... **viii**

CHAPTER ONE **1**
RESEARCH DESIGN **1**
1.0 Background to the Study 1
1.1 Statement of the Research Problem 4
1.2 Research Questions 5
1.3 Objectives of the Study 6
1.4 Significance of the Study 6
1.5 Scope of the Study 7
1.6 Hypothesis 7
1.7 Theoretical Framework 7
1.8 Literature Review 11
1.8.1 The Use of Biometrics in National Identification Systems 12
1.8.2 Implementation of Biometric Identification Systems 21
1.8.3 National Identification and User Acceptability 25
1.8.4 National Identification System in India 25
1.9 Sources of Data 27
1.10 Methodology 27
1.10.1 *Thematic Analysis* 29
1.10.2 *Data Collection Method* 30
1.10.3 *Data Analysis* 31
1.11 Arrangement of Chapters 32
ENDNOTES 33

CHAPTER TWO **36**
OVERVIEW OF NATIONAL IDENTIFICATION SYSTEMS IN GHANA AND INDIA **36**
2.0 Introduction 36
2.1 Overview of National Identification in Ghana 36
2.1.1 Legal Framework 38
2.1.2 Creation of National Database 39
2.1.3 Identification Ecosystem in Ghana 42
2.1.4 Current State of National Identification System in Ghana 43
2.2 Overview of the Indian National Identification System 45
2.2.1 Unique Identification Authority of India (UIDAI) 47
2.2.2 Identification Ecosystem in India 48
2.3 Challenges in the Implementation of NIS in Ghana and India 54
2.3.1 Implementation Challenges in Ghana 55
2.3.2 Implementation Challenges in India 57
2.4 Conclusion 59
ENDNOTES 60

CHAPTER THREE **62**
ANALYSIS OF THE RESEARCH FINDINGS **62**
3.0 Introduction 62
3.1 The need and benefits of national Identification in Ghana 62
3.2 The Challenges to the implementation of National Identification System in Ghana 67
3.3 Lessons Ghana can draw from the Indian experience 69
3.4 Measures for ensuring sustainability of a national identification program in Ghana 72
3.5 Conclusion 75
ENDNOTES 76

CHAPTER FOUR **77**
SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS **77**
4.0 Introduction 77
4.1 Summary of Findings 77
4.2 Conclusion 81
4.3 Recommendations 81

ENDNOTES 88
BIBLIOGRAPHY 89
APPENDICES 96

ABSTRACT

This study explores the implementation of national identification system through a comparative study of national identification in India and Ghana. The study is situated in the theory of organizing vision by Swanson and Ramiller. Data for the study was obtained from primary sources, mainly through interviews and secondary sources of information included internets, journal articles, books, reports etc. The study revealed that lack of central database poses a major challenge to the implementation national identification projects in Ghana. The study also revealed that strong legislative instrument is critical to protect both citizens' identity and national identification databases. The study also identified the best practices in the Indian Identification system that could be incorporated in the ongoing national identification project in Ghana, including the outsourcing of certain identification projects to the private sector to ensure cost effectiveness, efficiency and to make the project financially viable. The study recommends that there should be registration and issuance of national identity cards at birth. The national identity card should be the main requirement for the acquisition of any national document such as passport, driving license etc. It should also be the legitimate document to be used to access other government services like school enrollment, pension entitlements, among others, to serve as motivation for citizens with the aim of enhancing enrollment.

CHAPTER ONE

RESEARCH DESIGN

1.0 Background to the Study

Society has looked for solutions to the problem of identifying individuals in states for hundreds of years, using available technologies to meet the need.[1] Unfortunately, the qualities of identification system (IS) in countries vary based on financial capabilities and political commitment. Most developed countries have robust identification systems based on strong basic official documentation such as birth certificates but many people living in developing countries lack any official documentation.[2]

Human beings have had various ways to identify individuals and groups but the origins of contemporary national identification system date back to 1938, when lawmakers in the United Kingdom passed the National Registry Act, which mandated that all residents possess identity cards. Subsequently, Germany, France, Poland, Greece, among others, also instituted Identity Card (ID) systems after the end of World War II.[3]

Traditional social structures ensured local recognition during the early days, but communal systems of identification diminish with internal migration and urbanization. For many developing countries, this identity gap severely limits opportunities for economic, social and political development. Accordingly, robust identification services are urgently needed to address the identity gap. Nonetheless, recent advanced human recognition (AHR) technologies now offer accurate tools for identification (who are you?) and authentication (are you who you claim to be?)

In 1949, ID card adoption emerged in Asia, as newly independent governments sought to expand state authority. For instance, the Hong Kong and Taiwan governments introduced an identity card system to strengthen their sovereignty and quell immigration from mainland China. South Korea and Singapore followed suit in the 1960s for reasons of economic transformation.[4]

During this same period, most developing countries were under colonial rule and at different stages of the independence struggle. Generally, most French former colonies such as Algeria, Togo, Cote d'Ivoire and Mali maintained the identification systems inherited because of the assimilation policy of France which sought to extend national identification laws to all colonies.[5]

The issue of identification continues to be contentious because while others such as refugees, pensioners and potential electoral voters perceive it as a form of documentation which ensures their security, inclusion, entitlement and freedom, the ID system which has gained prominence as a method of identification has also been seen as government's encroachment on citizen's rights and its associated concerns of victimization, oppression and means for exclusion of some persons.

Similarly, Biometric identification has also provoked opposing viewpoints; while it has been seen as means of improving service delivery, its surveillance capabilities has also raised concerns with respect to privacy of users.[6] It is worth mentioning that in some countries such as Rwanda, historically had group classifications such as "Tutsi" and this identification mark played an ugly role in the ethnic violence in the country.[7] This Rwanda case signifies one of such fears or dangers of national identification system particularly biometric identification system in some states.

However, in recent times the utility and morality of national identification systems and the technologies adopted depend largely on the prevailing situation in respective countries.[8] For example, the issue of national identification gained prominence in the United States (U.S) after the terrorist attack on September 11, 2001. Advocates of national IDs in U.S argue that the terrorists were able to use false identities to obtain Social Security Numbers and driver's licenses from Virginia due to lack of national identification system in the country.[9]

Developed countries pursue national identification systems for security reasons while poorer nations deploy identification systems for developmental purposes including service delivery such as pensions and health insurance, among others. However, there are few exceptions. For instance, Pakistan's identity programme was initially introduced for security concerns but it has now been used for service delivery and welfare entitlements.[10]

Undoubtedly, ID card policies have become dependent on each country's institutional capacities and financial resources. Accordingly, the successful implementation of the biometric national ID project in India represents the opportunity for other developing countries to adopt feasible ID projects according to their respective national needs. For instance, the nationwide Indian Aadhaar identification project aims to register 1.2billion Indians by 2020. The Unique Identification Number (UID) biometric system collects all 10 fingerprints and an iris scan for both eyes for each citizen including other demographic information.[11]

Due to the benefits of biometrics, many countries around the world are now considering deploying biometric enabled national ID cards for their citizens. This biometric-based identification card can

also be used as a smartcard for various purposes including the distribution of government services and welfare benefits. In addition, biometric modalities are extremely difficult to counterfeit due to sophisticated detection features. Furthermore, establishment of a central biometric database is cost-saving in nature as the national ID cards can be used for different purposes including voting, health insurance and can also serve as main requirement for the attainment of other national documents.[12]

1.1 Statement of the Research Problem

The issue of a national identification card in Ghana has provoked diverse reactions with regards to its relevance and the motive behind the projects. Again, the debate over the merits of a national ID system failed to gain momentum in previous times, partly due to lack of citizens' appreciation of its real significance in the socio-economic processes in the country with regards to the personal benefits for users.

However, the emerging regional terrorism trends as evident in the recent terrorist attacks in neighboring Burkina Faso, Cote d'Ivoire and Mali, as well as the 2016 contestation of the electoral register validity over allegations of registered foreign nationals, among others, have revived the need and the call for the effective implementation of a national identification system in Ghana. Ghana's efforts to issue identification cards date back to 1973 when the Citizens Identity Card was introduced on a limited scale for the border regions as a cross border control measure. The project was discontinued three years later due to problems with logistics and lack of financial support.[13] Subsequently, various governments have invested substantial resources in terms of financial, human and technical, to address the issue of identification which resulted in the establishment of the National Identification Authority (NIA) in 2003 with the sole mandate to issue national ID

cards. However, it only resulted in proliferation of various biometric systems with little or no interconnectivity.[14]

Comparatively, the Indian identification programme launched on 28th January 2009 has registered over 1.12 billion members, 88.2 percent of the population, as of 2nd November, 2016 while the Ghana National Identification Authority (NIA) as of May, 2017 has enrolled only 4.5 million resident Ghanaians, representing 17 percent of the population.[15] Currently, NIA has commenced mass registration from the government institutions amid protestation about the required documents for the enrolment. For this reason, the main opposition party, the National Democratic Congress (NDC) has called on its supporters to boycott the exercise. It is against this background that I am motivated to thoroughly investigate this problem in Ghana. It is imperative to assess the challenges to the implementation of a national identification system in Ghana and also to identify the lessons the latter can learn from the Indian experience.

1.2 Research Questions

The research sought to identify the challenges to the effective implementation of a national identification system in Ghana and to propose measures to address obstacles. To appreciate and deal with this central problem, the following questions are raised by the study:

- What are the needs, benefits and challenges of a National Identification system in Ghana?
- What lessons can Ghana learn from the Indian experience?
- What measures can be taken for ensuring the sustainability of a national identification programme in Ghana.

1.3 Objectives of the Study

Generally, the study sought to find out how Ghana, can draw lessons from the Indian experience in adoption of National Identity card system. Specifically, the study sought to achieve three specific objectives, namely:

- Identify the need, challenges and benefits associated with the implementation of a national identification project in Ghana.
- Identify the lessons Ghana can draw from the Indian experience.
- Propose measures for ensuring the long-term sustainability of a national identification program in Ghana.

1.4 Significance of the Study

The adoption of national identity management systems has become crucial to the establishment of strategic partnerships between the state and citizens.[16] It is also important to note that failure to register populations and provide identity documents is believed to have detrimental effects for both the individual and the state, thus the essence of this study. To better understand and serve citizens, countries are paying increasing attention to establishing national identification systems and the role they play in strategic political, economic, and social development.[17]

The study therefore highlights the needs and benefits, as well as the challenges with regards to the implementation of a national identification programme in Ghana. Another significance of this study is hopefully to draw some useful lessons from India. The findings would hopefully assist the relevant Ghanaian authorities to incorporate the necessary measures to achieve the intended goals of national identification system in Ghana and the measures to be taken to sustain the programme.

1.5 Scope of the Study

This study is limited to the needs, the benefits and challenges facing the implementation of national identification projects in Ghana, including the current "Ghana Card" project and the necessary measures adopted to address the situation and sustaining the projects. In this regard, the study also covers the identification of the best practices in the Indian Aadhaar System.

The study was to have been conducted and completed within a 3-month period from May to July, 2018. However, due to constraints in gathering data and conducting interviews, this was not possible as the researcher asked for a further period of extension in order to complete the study. Thus, instead of 3 months, the research was completed in 5 months.

1.6 Hypothesis

The successful outcome of the ongoing national identification programme in Ghana would depend greatly on sustained funding, improved participation and political commitment.

1.7 Theoretical Framework

The main theoretical concept that underpins this study is the Organizing Vision (OV) which helps to explain the decisions of governments to adopt Information Technology (IT) innovation such as the pursuit of biometrics in national identification programmes. The OV theory was propounded by Swanson and Ramiller in 1997 to explain how a collective process of creating a vision enables successful adoption of programmes both within and across organizations.[18]

Organizing vision provides a useful framework needed to understand the series of actions taken by institutions to facilitate the adoption and use of new technologies.[19] In contrast to traditional

perception that the early decision to adopt a new technological innovation occurs as a result of local and rational organizational processes which are subsequently institutionalized to reflect the updated version of the technology,[20] Swanson & Ramiller argue that technological innovation can be better explained by considering the phenomenon as a collective process of creating and propagating an organization vision that seeks to coordinate decisions and actions towards the technology's materialization and deployment.[21]

Accordingly, Weick considers the organization vision concept as a sense-making process, and Swanson & Ramiller opine that "in so making sense of the innovation, the community in effect also defines it and creates it." Arrival of new technologies such as biometrics is mostly met with uncertainties regarding its benefits, future prospects and long-term consequences. An organizing vision, defined as "a focal community idea for the application of information technology in organizations", is therefore intended to reduce the uncertainties associated with these new technologies.[22]

Swanson and Ramiller highlighted three main functions of an organizing vision:

Interpretation- When a new technology is adopted in the society, its meaning and implications are initially not well understood by the organizational actors or the implementation stakeholders. It is against this background that organizing visions are generated to provide focus for the interpretation of the innovation.[23]

Legitimation-These organizing visions also provide the reasons and justifications for the adoption of an innovation, basically answering the question, 'why do it?' The legitimation process is

facilitated through the authority and prominence of individuals promulgating the vision. In an example cited in Swanson and Ramiller, the organizing vision can be promulgated as follows: an interior minister may ask his or her civil servant "why aren't we doing biometrics yet?" This organizing vision generated by such a reputable individual could facilitate the promulgation of the innovation. [24]

Mobilization- The organizing vision serves as a driving force that energizes market interest and related activities with regards to the realization of the innovation. It also provides clues and guidelines on the needed resources, including hardware, software and technical skills needed for the adoption of the innovation.[25]

Swanson and Ramiller insist that organizing visions are produced and sustained by the society with a common interest of either agreeing or disagreeing with the content of the vision. The existence of discursive interpretation over the meaning of the technology could be a potential for disagreement. Again, the vision's interpretability and plausibility would determine how compelling it is to other shareholders and its eventual success or failure.[26] Plausibility complements interpretability in the sense that both identify qualities of the community discourse that builds and sustains the OV. However, while interpretability concerns the intelligibility and informativeness of the community discourse, plausibility focuses on distortions in the discourse.[27]

Similarly, Swanson and Ramiller used the organizing vision concept to highlight the differences between 'mindful' and mindless innovations. Mindless innovation arises when organizations or society pursue new technology like biometrics because others are doing so. In contrast,

organizations and societies that innovate mindfully do so "with reasoning grounded in organization facts and specifics."[28]

Swanson and Ramiller identified five attributes of mindful innovation, including learning from failures, sensitivity in addressing minor technological issues, commitment to resilience and reluctance to oversimplify interpretations of new technology. Mindful organizations pay special attention to the opinions of experts than the formal authority. To this end, it could be argued that the organizing vision concept serves as an appropriate analytical tool to study the acceptance of technological in innovation in the society with regards to building consensus in the early stages of its adoption.

According to Reardon & Davidson, the OV theory have been employed to ascertain the adoption rate of Electronic Medical Record (EMR) technology by independent physicians. The pair used the theory to conduct a survey and it was established that prior to the adoption of EMR technology, individuals and organizations must become familiar with the innovation through community-wide interactions and discourse related to the innovation.[29] Relying on the definition of Swanson & Ramiller to the effect that OV derives the community acceptance for the adoption of technological innovation in organizations, Reardon & Davidson concluded that OV helps in shaping how decision makers perceive the future application of technology innovations such as EMR.[30]

The organization vision concept is therefore applied in the study to explore how Ghanaians perceive the use of biometrics for identification and to what extent their discourses within the community facilitate the implementation of the biometric identification system nationwide.

Contrary to Swanson and Ramiller assertion that organizing vision serves as a vital driving force behind society's adoption of new technology or innovation, Fichman (2004), is of the view that several factors impact on the adoption of various ICT innovations. Critics of the Organizing Vision concept, therefore, argues that organizational adopters of innovation make independent rational decisions that are driven by economic and technical efficiency objectives (Strang & Meyer, 2001) and not just a mere societal acceptance as advocated by the Organizing Vision concept. Therefore, the Organizing Vision theory fall short of accounting for the institutional complexities of modern organizational environments within which ICT innovations are developed and adopted (Currie & Parikh, 2005).

1.8 Literature Review

This section is devoted to a critical review of multi-disciplinary literature on national identification systems, especially on biometrics technology which features prominently in modern identification projects globally. Implementation of identity policies faces formidable challenges due to the interplay of social and technological consideration. The decision on how and where to store identity information poses a major challenge as centralized databases enhance security protections but becomes natural targets for hackers. Again, technological or human error in the database can permeate an entire community as other institutions also rely on the stored data. An individual could be excluded from the society due to lack of registration while fraudulent registration becomes difficult to detect and reverse.[31]

Furthermore, security and privacy concerns also complicate identification system configuration, making it difficult for policy makers to reconcile the technological features of the system and

societal considerations.[32] Most developing countries have implemented a number of national identification systems in an attempt to curtail incidences of crime and enhance the provision of services to the citizens. However, despite the efforts and the perceived benefits of identification projects, numerous challenges continue to hamper successful implementation in Africa.[33] For example, in Ghana, there are several independent identification system initiatives running concurrently. The health insurance scheme, voters' register, business registrations, social security numbers, birth and death register, biometric passports and drivers' licences form part of the various registration programs rolled out by government agencies in different databases.[34]

1.8.1 The Use of Biometrics in National Identification Systems

In recent time the use of biometrics in national identification systems have gained prominence globally and it is therefore prudent to analyze the nature and form of biometrics currently being adopted for national identification systems worldwide. Accordingly, the inherent problems in biometric technologies and applications, as captured in research works on errors in pattern recognition, fusion of multiple (multi-modal) biometrics,[35] and enhancing the efficiency of biometric database, among others, would also be evaluated.

Biometrics is invariably the physiological or behavioral measurements aimed at identifying an individual or verifying the identity of someone.[36] Types of biometrics include facial recognition, hand geometry, fingerprints, vein and iris patterns, DNA profiling, among other emerging techniques such as nose and ear biometrics.[37] Again, behavioral measurement techniques also include voice recognition, gait recognition, signature recognition, among others. Furthermore, bodily measurement must satisfy four requirements to be classified as a biometric, namely:[38]

Universality - All participants have equal access to the system. If different biometric schemes- that is Iris, facial, or fingerprint- are deployed across the same population of users, then it's not universal since individuals may have to use different biometrics for identification.

Distinctiveness--To ensure that different users do not share the same characteristics. For instance, the use of height or weight as a biometric identifier would make it difficult to differentiate individuals' other similar bodily characteristics.

Permanence -To ensure that identifiers are maintained over a considerably period of time with regards to the matching criterion since rapid variations of identifiers could cause matching problems and would require regular re-enrolment of biometric data. This could render the system ineffective and cause astronomical increase in the cost of enrolment.

Collectability --A biometric identifier should be measurable quantitatively. A bodily characteristic that cannot be measured could not be used as biometric. An internal feature of the body like the vein patterns in the hand is measurable and can constitute a biometric.

Additionally, in a practical identification system that uses biometrics for personal recognition, there are other factors that are worth consideration, including:

Performance--The technological resources required to achieve satisfactory recognition accuracy and speed, including enabling environmental factors.

Acceptability--The level of awareness and the willingness of the populace to accept a particular biometric identifier as a means of recognition.

Circumvention--The extent to which the system is susceptible to fraudulent activities.

To this end, a biometric system can use any human physiological or behavioral features as an identifier as long as it satisfies the universally, distinctiveness, permanence, and collectability

requirements. Again, biometric deployment should also meet desired recognition accuracy, speed and relevant resources, user friendly, accepted by the target population and has sufficient security measures to address issues of fraudulent activities and other system breaches.[39]

Enrolment

Regarding the deployment of biometrics in national identification, enrolment process involves the capturing of biometric information for storage purposes and the extraction of certain required characteristics in the data to generate a biometric template A template could be defined as a compressed biometric data.[40] It is noteworthy that although actual biometric information, including images are saved for administrative purposes, the template (which is not the actual fingerprint or Iris image but rather a digital code) are stored in the biometric system for recognition.[41]

Verification

Subsequently, biometric verification is the authentication of a claimed identity against a previously stored biometric template.[42] In other words, verification is the comparison of captured data against stored biometric template. A person presents him/herself as being someone and the biometric system, though the process of verification, seeks to confirm the identity of the claimant. Again, Wayman refers to the process as "Positive Recognition" which aims at preventing different people from using the same identity.

Identification

Finally, biometric identification process includes the comparison of live biometric information against the biometric database with the aim of establishing "whose biometric data is this." While verification is the one-to-one comparison of captured live data against a previously recorded template, identification establishes identities by means of a one-to-many comparison.[43] Again, Wayman refers to the identification process as "negative recognition" where the biometric system establishes whether an individual is who he/she denies to be. Negative recognition seeks to rather prevent individuals from using multiple identities. It should be noted, however, that the process of negative recognition can only be possible if the claimed biometrics have been previously captured in a database.

Biometric system errors

Despite the prominence of biometric identification system in recent times, there are numerous factors that can contribute to the malfunctioning of a biometric system. Physiological bodily changes, such as bruised fingers may impinge data capture and template matching, which in turn can prevent a biometric system from enrolling or authenticating a fingerprint data, while an over grown beard can also unhinge a facial recognition system. Again, imperfect ambient conditions such as temperature, humidity, dirty sensor, etc. as well as inevitable inconsistencies associated with users' interactions with sensors or cameras, can undermine the performance of a biometric system.[44]

Accordingly, review of the different types of system errors that may arise from the above stated conditions would be worthwhile.[45] asserts that "lack of understanding of the error rates is a primary

source of confusion" in assessing the performance and accuracy of a biometric system. The biometric system errors include:

Enrolment errors - the first process in the biometric identification system is enrolment, where identifiers of individuals are captured, stored and compressed to generate a template.[46] Two types of errors are associated with the enrolment process, namely, failure to capture (FTC) and failure to enroll (FTE) errors. FTC errors arise when a system fails to read a physical characteristic of an individual due to lack of satisfaction imaging conditions (Jain et al, 2004). FTC errors result when a system rejects a biometric data input that do not satisfy quality standards. Accordingly, Jain et al. indicate that the system's FTE rate is the measure of users' ability to join a biometric system, and such enrolment failure constitutes a formidable socio-economic problem in the national identification system with regards to issues of inclusion and exclusion, important areas, that would permeate discussions throughout the thesis.[47]

Matching errors- failure to enroll (FTE) errors can generate two further types of errors, namely, false matches (referral to as false acceptance or false positive) and false non-matches (also known as false rejections or false negative). A false match arises when a biometric system mistakenly accepts the biometric data input of an individual by identifying them as someone they are not. False match errors may include mistakenly accepting an individual who has not been enrolled into the database or matching a previously enrolled user to someone's record.[48]

Conversely, a false non-match results when a system mistakenly reports that a user's biometric is not in the database, when in fact, the data has previously been enrolled. The above stated errors represent the probability that a given user would be mistakenly accepted or rejected or in other

words falsely identified. These probabilities are respectively known as false match rates (FMRS) and false non-match rates (FNMRS). FMRS and FNMRS are therefore very essential in determining the acceptance rate of a biometric system. The acceptance rate, known as the "threshold value" generated from the composite graphs of FMR and FNMR, assist decision makers to determine the acceptable limits for a given biometric system. The higher the threshold value, the higher the FNMR component and the more secured the system in terms of occasionally rejecting an enrolled user, erring on the side of caution and very less likely to accept a fraudulent data input as valid.

On the other hand, if the threshold value is lowered, the system is rendered less sensitive, and becomes tolerant of input variations, thus increasing FMRs. Accordingly, low threshold value systems are often adopted in low security communities where consequences of a false match are minimal.[49]

Limitations of Biometrics

Every biometric system has its inherent limitations and error rates with regards to the specific bodily identifiers being measured. For instance, it is well known that manual laborers (especially in the construction industry) and the aged tend to encounter authentication problems with the fingerprint biometric system due to bodily wear down or wrinkles.[50]

Earlier, there had been perceptions that Iris biometrics can generate a permanent template that could be functional throughout an individual's lifetime, thus preventing periodic re-enrolment that is not only inconvenient to the user but also inflates administrative cost of the system. However,

Bowyer et al have disputed these perceptions through a finding that the FNMR of Iris biometrics can raise over time.[51] Since pupil dilation of the Iris and contact lenses could undermine the accuracy of Iris recognition. The British National Institute of Standards and Technology (NIST) conducted comprehensive public evaluation of the performance of facial recognition biometric systems and reported, among others that men were easily recognized than women; heavier individuals were easier to be recognize than slimmer users; and Asians were more easily identified than Caucasians by facial recognition systems. All these technical anomalies and technological unreliability and its accompanying exclusionary effects continue to limit the performance and accuracy of biometric system.[52]

Innovations in Biometrics

Researchers have demonstrated the possibility, though largely untested, of reconstructing or regenerating fingerprint and facial images from recorded biometric templates. These discoveries pose concerns about a potential privacy breach in biometric technologies as stolen templates can be regenerated to obtain original images. In an effort to address these privacy related concerns, other researchers have also designed "cancellable" biometrics 60 with the aim of intentionally distorting a compromised biometric to recreate a new variant and re-secure the identity. This transformation process is non-invertible making it very difficult if not impossible to recover the original biometric image.

Biometrics and Identity

The social science literature on Biometric Identification encompasses public debate on the use of biometrics and its implications in the society vis-a vis the sociological, cultural, ethnical and political considerations.

On the issue of Biometrics and identity, Van der Ploeg,[53] established the sociological relationship between the physical body, biometrics and identity, and argued that the use of biometrics prioritizes the physical body in relation to identification. The system relies on the body to recognize or confirm the identity of individuals. For example, there is an established history of the police branding criminals by tattooing a visible social mark on their bodies, bringing into focus the history of the use of anthropometry, a criminal identification system designed by Alphonse Bertillon in the 1800s, which used various bodily measurements for identification.[54] Examples are the use of nose measurements and tattooing in Nazi Germany. Subsequently, Torpey established the link between these techniques and modern methods of identification and concluded that the new techniques have become more sophisticated and reliable, shifting from subjective characteristics and measurements to fingerprints, scanned palm-prints and retinas, and DNA profiling.[55] To this end, Van der Ploeg established the link between the physical body and the biometric body, emphasizing that the biometrics generate a readable body by transforming the physical body into digital codes.[56]

Biometrics and Privacy

Regarding the biometric-privacy dichotomy, Clarke[57] argued that the use of biometrics in identification threatens society's protection against governments and corporations, and further

outlined the main threats posed by biometric technologies on the privacy of users, including population control, identity theft, monitoring of movement patterns of users, masquerade, automated denial of identity and infringement on civil and democratic liberties.

Alterman also address the ethical issues relating to the privacy concerns of biometric identification and concluded that biometrics are not immune to the threat of information leakage and other privacy related concerns. [58]

Biometrics and Security

On the issue of biometrics and security concerns, Gates[59] analysed the evolution of facial recognition technology (FRT) vis-a-vis international terrorism concerns following the 9/11 attack in the United States and highlighted the main factors that led to the adoption of FRT immediately after the September 11 attack. Gates indicated that aside the use of FRT as a solution to identifying terrorists, the technology has also been adopted by governments to enhance homeland security with regards to identification of individuals. Again, the FRT has the ability to identify suspected individuals in a distance and thus helps in identifying terrorists at a distance. Lyon also highlighted the potential surveillance capabilities of biometrics, insisting that the introduction of new biometric ID cards forms part of a large-scale scheme of social sorting where individuals are classified into "eligible members" of states and the undesirables, thus turning the human body into a source of surveillance. [60]

Biometrics and Social Inclusion or Exclusion

Regarding the inclusionary or exclusionary effects of biometrics, most researchers are of the view that biometrics, particularly the multi-modal system, ensure the participation of everyone due to

the use of different biometrics in the identity system,[61] but Lyon[62] considers biometrics as exclusionary and a form of social sorting.

Wickins defines social exclusion as "any unfair restriction or removal of access to the range of social goods and activities that other members of that society do, or could, take for granted."[63] Wickins indicates that the social goods may include healthcare, social security benefits, among others and further states that individuals most likely to be excluded include people with mental illnesses, the homeless, the elderly, people of certain races and religious backgrounds and those with physical disabilities.[64] He dismissed the argument in favor of a biometric identification system to the effect that the public interest is paramount and that the rights of many outweigh the rights of the selected few.[65] At this juncture, having analyzed the application of biometrics in identification systems in recent times, it would be prudent to evaluate how identification policies are implemented. Accordingly, the challenges inherent in the implementation process would be highlighted.

The reasons for the implementation of national identity projects have generally been to ensure efficiency and cost-effective provision of services and higher levels of security. However, to achieve these goals, the complex implementation process requires effective cooperation from all the stakeholders.

1.8.2 Implementation of Biometric Identification Systems

Globally, various government ministries have adopted the biometric identity system to offer services in the areas of healthcare, education, social security benefits, among others. Again, the

United Nations 2016 development Index Survey confirmed that 98 countries require biometric ID for citizens to be able to access online government services (UN Survey, 2016). The attempts by governments to incorporate the use of biometric IDs in the delivery of services are motivated by the New Public Service Movement which advocates for equal rights of citizens. Ducastel also indicated that countries have different motives, including security and service delivery for adopting biometric identification systems based on their respective challenges.[66]

Legislative Support

Implementation of a nationwide identification system requires a firm legal and regulatory support which mandates the use of such identity cards. Again, the UN 2016 index stated that the enhanced integration of biometric ID technology requires the adoption of the appropriate legal framework and security system to protect confidentiality of personal data.

Gellman [67] opines that privacy concerns are the main driving forces behind governments adoption of data protection laws relating to access of personal information across agencies. For example, strict levels of legal clearance are required to access the national database of India and the Pakistani National Database and Registration Authority (NADRA) has adopted a legal framework that allows citizens to see the organizations or individuals that have accessed their data.[68]

Challenges to the Implementation of National ID System

The lack of effective national identification system in developing countries constitute a major challenge to national growth.[69] According to a research conducted by International Telecommunication Union (ITU) on 48 national identity programmes and initiatives in 43

developing countries, the major challenges to the implementation of ID systems in developing countries included:[70]

Lack of institutional accountability and transparency--According to Anderson et al alleged issues of corruption with regards to the awarding of contracts and tenders in Malawi, Thailand, Uganda, Mozambique, Nepal and Guatemala accounted for the delays in the implementation of ID programs in the respective countries. Particularly, implementation of the identity programs was halted in 2006 and 2010 in Thailand due to suspicions of corruption in the auction process.[71]

Privacy- this concerns continue to be one of the main oppositions to the usage of national IDs as Civil Liberty groups, mainly in the U.S and the United Kingdom, have described the adoption of a national identification system as a large-scale privacy invasion of users by their respective governments. There had also been similar concerns in China, where the police could virtually monitor the movements and personal information of citizens using their IDs

Data Management --The efficient management of databases is fundamental to the maintenance of national identification systems. Challenges in the maintenance of databases have been reported in countries like Guatemala, Ghana, Burkina Faso, Mali, Bangladesh and Indonesia. For example, in Ghana, data capturing began five years after the completion of the central database, leading to inconsistencies in the number of registered individuals and recorded data. As a result, out of the 15million Ghanaian citizens that registered, the data of only 9 million were captured into the central database.[72] For Bangladesh, Burkina Faso and Guatemala, the problem was recording wrong user information, rendering the identification programs ineffective. For instance, Guatemala had to re-print over 2.9 million cards to reflect corrections.[73]

Enrolment Challenges--Enrolment is a vital stage in the implementation of national identification systems. According to Anderson et al, some of the factors that hinder the effective registration of

citizens include insufficient equipment and materials, under-trained staff, communication in relation to the use of appropriate local dialect in multi-ethnic countries, logistical support, lack of standardized guidelines and lack of public awareness.[74]

Lack of financial and capital support more often than not contribute to the delays and indefinite suspension of the implementation of national ID systems in most developing countries, including Cambodia, Malawi, Tanzania, Cote d'Ivoire and Uganda. For example, there was a one-year delay in the National Identification programme in Malawi due to inadequate funds and the registration program in Cote d'Ivoire was delayed on several occasions due to the lack of capital for logistical support and payment of technical enrolment teams.

Technical Challenges—Sharifa et al, 2012 identified technical challenges such as low ICT coverage, bad system designs and lack of interoperability between devices hinders implementation in developing countries. [75] For instance, the implementation of biometric ID cards in Algeria was delayed due to lack of logistical and equipment services support.[76] Again, Gelb and Clark identified the lack of basic ICT infrastructure as a significant barrier to the integration of biometric identification systems in developing countries. These ICT infrastructural deficiencies have been considered as a major problem in Latin American Countries.[77] To remedy the situation, developing countries are admonished to adopt the Georgian innovative approach by providing ICT facilities in public service centres and village development halls with stable electricity and internet service, as well as technical support units to enhance user's interaction with the system

Inadequate private-sector-participation-- Gelb and Clark opine that most governments implement ID policies with limited participation from the private sector mainly due to the lack of public service policies that encourage the involvement of private entities during the design and deployment of identification projects.[78]

1.8.3 National Identification and User Acceptability

Again, the issue of users' acceptance and satisfaction is worth mentioning. El-Abed et al evaluated the use of biometric system in identification as to users' acceptance and satisfaction and concluded that the robustness of the system against fraudulent attacks and the ease of verification were the factors that influenced the acceptance and satisfaction of most respondents. However, the lack of consensus in relation to users' participation in designing and evaluating the biometric systems was identified as the major drawback of biometrics in national identification systems.[79]

1.8.4 National Identification System in India

Having discussed the application of biometrics in identification systems and the problems inherent in the implementation of identification policies, the ambitious and comprehensive national identification program in India would also be reviewed in terms of the biometric technology adopted and the implementation policies with the aim of identifying the best practices that could be incorporated in the ongoing national identification exercise in Ghana.

The Indian Unique Identification Authority (UIDAI), created in 2009, has embarked on a comprehensive program to provide its citizens and foreign national resident in the country with a unique identity. The Universal ID (UID) program, which is the largest deployment of biometrics in national identification worldwide, aims to enhance the delivery of government services, improve security, and reduce fraud and corruption in the distribution of welfare rations, among others.[80] The UID program uses multimodal or multiple biometrics (both fingerprints and iris) to ensure a higher rate of inclusion and the mobile nature of the biometric technology promotes inclusion and enhances enrollment. Unlike other national identification projects, the UIDAI does not necessarily

provide a card, but an Aadhaar number, which is deemed enough to verify and authenticate identity once provided.[81] Accordingly, the UID has been described as cost effective based on an estimate from the cost of enrolling 200million individuals as of February, 2012, which pegged the cost of enrolling and issuing a number at approximately Rs.40.62 (US$0.79).[82] For purposes of sustaining the project, the UIDAI has a policy to charge agencies using its database for authentication in an attempt to gradually defray the initial cost on the program. To ensure the autonomy of UIDAI for purposes of administrative expediency, the head of the identification authority has been elevated to a cabinet minister level post.

According to Gelb and Clark,[83] there are over 230 biometric identification programme in over 80 developing countries. In all these cases, biometric technology has been used to identify individuals for different developmental purposes. However, many identification projects in Africa failed to achieve its intended goals partly due to technological difficulties and implementation problems with regards to lack of political commitment and astronomical cases of corruption. For example, Uganda national ID project was highly fraught with scandals. As of July, 2012, the Ugandan Identification Authority had issued only 400 ID in two years after the commencement of the project and several ministers and administrators were accused of violating procurement laws, and instances of stolen equipment and other fraudulent activities were also reported.[84] Accordingly, Indians national identification project, in terms of scope and successful enrollment rates, has attracted the attention of scholars including Zelazny, Gelb & Clark, among others, who insist developing countries can learn from the Indian experience.

1.9 Sources of Data

Regarding the sources of data, the study utilized data from both primary and secondary sources. Interviews were used to elicit primary data from personnel of the above-stated organizations and the secondary data was collected through the use of government policy documents, articles, online sources, among others. This research adopted the semi-structured technique of interviews where there was a pre-defined question, but interviewees were also allowed to share their views on issues related to the topic.

1.10 Methodology

Research design defines the means to study a phenomenon or the method(s) a researcher adopts to study a phenomenon. There are three types of research designs, namely, quantitative, qualitative and mixed strategies research designs.[85] This study adopted the qualitative research design.

Quantitative research design necessitates the use of numerical data collection methods such as the use of questionnaires and the use of graphs or statistics for data analysis, as well as relying on measurements and scientific methods to interpret a research data. Quantitative research design, more often than not, gives accurate predictions but it has been criticized for inadequate explanations of mitigating factors needed to fully understand a phenomenon.[86]

The mixed strategy combines both quantitative and qualitative research designs, and as such finding from this method could be comprehensive and thought provoking but it is not suitable for time constraint researches like this study since it involves the use of multiple sources of data, different research methods and sometimes more than one researcher to study the same phenomenon.[87]

Qualitative research design involves non-numerical data collection methods such as interviews and observation and uses data analysis procedures like data categorization and content analysis. Although qualitative research could be tedious and complicated, it is interpretative in nature and it enables the researcher to acquire an in-depth knowledge about the phenomenon including emotional feelings of respondents and the thought processes, which are often difficult to appreciate when using quantitative methods.[88] The reason for my choice of the qualitative research design is that it involves explanations, which are needed to understand why previous national identification attempts in Ghana failed. Another reason for my choice of qualitative research method is to enable me interview people in their natural setting (in their homes or offices). This method also allows researcher to address the 'how' or 'why' questions with case study approach and in the explanation of a social phenomenon like the implementation of national identification system in Ghana.

Research strategy outlines how the researcher intends to conduct the study. The main strategies include experiments, survey, narrative enquiry, case study, among others.[89] This study seeks to acquire an in-depth understanding of the national identification system in Indian and the best practices that could be incorporated in the ongoing national identification exercise in Ghana. This apparently makes the research a comparative study of identification systems in Ghana and Indian and therefore requires a strategy that would unearth the challenges inherent in the implementation of national identification in Ghana and also highlights the best practices in the Indian experience. Accordingly, the researcher chose the case study research strategy because it involves an empirical investigation of a real-life phenomenon, like the ongoing national identification exercises in both countries, using multiple sources of evidence.

Regarding the study population, it is emphasized that the importance of identifying the right place and the right participants with regards to collection of data.[90] In view of this, the population of the study would be restricted to personnel from the National Identification Authority, security and border control agencies, officials from the political divide, Think Tanks, Legal luminaries, the Indian High Commission in Accra, the Ghanaian High Commission in New Delhi, the banking sector and selected academic fields. Thus, in most cases, I used in-depth interview method to reach out with these categories of personnel.

With regards to the sampling method used in the study, I adopted purposive (non-probability) sampling method to select individuals whose duties border on identity verification in their respective organizations, and those who possess in-depth knowledge in the national identification systems in both countries, corroborating with the assertion that selection of samples should be tailored to achieve the aims of the research. Purposive sampling is basically a non-probability sampling technique, where the researcher subjectively selects the units that are to be studied. It is also known as judgmental and usually the sample being investigated is quite small, especially when compared with probability sampling techniques.[91]

1.10.1 *Thematic Analysis*

The methodology employed in this study was a thematic study supported by qualitative data collection and data from secondary sources. Thematic analysis is used in qualitative research and it focuses on examining themes within the data.[92]

To establish the likely challenges linked to the national identification scheme, the following steps were taken;

a. Interview of key informants in stakeholder institutions that benefit from the successful implementation of the NIS in Ghana
b. Comparison of the NIA and Aadhaar approach for recognizable difference and similarities that would inform the challenges and recommendations
c. Review of existing research papers and articles for consensus on identified challenges and recommendations.

1.10.2 *Data Collection Method*

Qualitative data collection in the form of Key Informant Interviews (KIIs) were conducted over a period of six (6) weeks. In total, nine informants were interviewed from institutions that cut across security agencies, academic institutions, namely:

- Criminal Investigation Department (CID) -R1
- Interpol, Ghana -R2
- The Bureau of National Investigation (BNI) -R3
- Department of Political Science, University of Ghana -R4
- The High Commission of India in Ghana -R5
- The National Identification Authority (NIA), Ghana -R6
- The Statistics Department, University of Ghana -R7
- Former CEO, NIA -R8
- The Passport Office, Ghana -R9

The interviewees details were anonymized with ID codes R1-R9 for identification purposes. They were each asked a series of questions related to their assessment of the need for National

Identification, the challenges to creating a unified database and what they considered the necessary steps to ensure its success, in relation to the functions and interests of their respective institutions. While the intended approach was to record voice interviews and transcribe responses for analysis, the current political climate in Ghana made most respondents wary of the presence of a recorder. As such, ensuring informant participation required a concession which allowed responders to respond in writing to the interview guide question. The transcripts were coded basic themes, categorized under the global themes of:

- The need for a unified national identification scheme
- The challenges to establishing such a scheme
- The recommended measures to ensure its success and sustainability

Coding was guided by identified themes uncovered in the literature review and the research that preceded data collection. Similar quotes were linked to the specific organizing themes which they supported. Quotes which weren't similar in content, but alluded to the same organizing themes, were further categorized in basic themes.

In the thematic framework, quotes were directly linked the ID codes, as well as the specific themes they represent. The framework is outlined in Table 1 (Appendix 1) and Table 2 (Appendix 2) indicating which interviewees provided quotes for each set of themes related to the need for national identification, as well as the challenges observed in its execution.

1.10.3 *Data Analysis*

The data obtained from interviews were transcribed and the field note typed out and meaning made out of the data. I also utilized coding and the use of direct quotes from study respondents. Coding

is basically the process of developing themes within the raw data by recognizing important frequency in the data and encoding it prior to interpretation.[93]

Context analysis was used for the secondary data sources like books, journal articles, internet sources and reports and such information were analyzed along themes in the study. Furthermore, I used tables to illustrate some fieldwork information, all these were done with the hope of making meaning out of the data gathered much easier.

1.10.4 Ethical Considerations

Bordering on ethical consideration, participants were adequately informed about the academic nature of the study and at no point in time was deception used to gather data. Participants were also assured of anonymity with regards to their responses in conformity with confidentiality codes.

1.11 Arrangement of Chapters

This research is organized into four Chapters:

The first chapter contains the research design which comprises the background to the research problem, statement of the research problem, objectives of the study, scope of the research, significance of the study, research questions, hypothesis, theoretical framework, literature review, and sources of data and arrangement of chapters.

The second chapter contains the overview of the national identification systems in Ghana and India. The third chapter contains the analysis of the research findings, and the fourth chapter summarizes the research findings, conclusions and recommendation.

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CHAPTER TWO

OVERVIEW OF NATIONAL IDENTIFICATION SYSTEMS IN GHANA AND INDIA

2.0 Introduction

This chapter is devoted to the history of national identification in case countries, Ghana and India, and the current state of such initiatives with regards to the legal frameworks, management of national identification databases, institutional support, logistics, technology, and social awareness and acceptance. The implementation challenges of the National Identification Systems in both countries would also be reviewed.

2.1 Overview of National Identification in Ghana

The earliest attempt to register citizens in the then Gold Coast began in 1888. This was under the Cemetery Ordinance Law, which was limited to the registration of deaths and mostly expatriate employees of the then colonial government. Subsequently, the registration of Births, Deaths and Burials Ordinance was also introduced in 1912 after the Cemetery Ordinance of 1888 was amended in 1891. Again, the law was amended in 1962 to adopt the Registration of Births and Deaths Act 301 of 1965.[1]

Subsequently, Identity Card Decree (NRCD129) was adopted in 1972 which required all citizens aged sixteen years and above to be issued with national ID cards for purposes of identification. The identity card was a requirement for all job recruitment activities and also served as the evidence of one's eligibility for employment. Accordingly, all public and private employers were mandated to capture the identity card numbers of workers on their employment records and those

eligible for social security benefits or contributions were required to use their ID numbers instead of the Scheme number.[2]

National identity cards were issued in 1973 to citizens in five border regions of Ghana including Brong Ahafo, Northern, Upper Region, Volta and parts of Western Region as a cross border control measure. However, the project was discontinued three years later due to lack of logistical and financial support.[3] The issue of the national identification was revisited again in 1987, when the government of the Provisional National Defence Council (PNDC) through the National Commission for Democracy (NCD) established a technical implementation committee, to propose measures towards a sustained national identification system in the country with regards to the mode of data storage, the cost involved and the source of funding. However, due to economic difficulties, the project was not pursued.[4] Again, during a meeting of the National Economic Dialogue group in 2001, the issue of National Identification System (NIS) emerged as a major developmental concern. As a result, a Technical Committee comprising of members from shareholder organizations was established with the mandate to:[5] study and review the 1991 National Identification report; establish the main principles and the conceptual procedures for an integrated national identification system for Ghana, and to develop a plan of action and a time frame for the implementation of the system.

Subsequently, the Technical Committee completed its mandate in 2002 and submitted a report to the Cabinet. The report formed the basis for further actions to be taken by government to the effect that any national identification system should cover all citizens including legally resident non-

Ghanaians with the aim of ensuring crime prevention, revenue collection, delivery of public services and to assist in the creation of a credible voter register.

2.1.1 Legal Framework

In this regard, the government in 2001 attempted to develop a comprehensive biometric-based national identification system. Accordingly, Act 655 of 2001was enacted to amend the Electoral Commission Act 451 of 1993, replacing it with ACT 707 of 2006, which paved the way for the establishment of the National Identification Authority (NIA).[6]

The legal framework for the NIA mandated the authority to create the National Identification System (NIS), a database recording Ghanaians and foreigners residing permanently in Ghana and issue the national identification card. The legislation was further supported with the National Identity Register Act, 2008 (Act 750), which, mandated the NIA to (i) create, maintain, provide and promote national identification, (ii) collect data on Ghanaian citizens at home and abroad and foreigners with permanent residency, (iii) issue identification cards and (iv) ensure the integrity of and protect the data collected. The NIA, by the law, is expected to frequently and regularly publish an updated list of state institutions that use the data in a bid to champion transparency and security in the execution of identification. The act essentially forms the basis on which NIA operations and regulations are formed.[7]

This Act outlines the mandate of the NIA and governs the capturing of data. It requires that the NIA ensures the accuracy, integrity, confidentiality and security of the data. It makes it the NIA's sole responsibility to ensure that sensitive personal records are not found in the hands of malicious

agents who would use the data to benefit unduly and/or harm the stakeholders of the National registry. In addition to a chairperson and executive secretary, the board consists of representatives of the Ghana Statistical Service, Social Security and National Insurance Trust, Births and Deaths Registry, Ghana Immigration Service and National Health Insurance Scheme.

The law makes provision for the establishment of the national identification register and the maintenance of an electronic database. In 2012, the Ghanaian Parliament adopted L.I.2111, National Identity Register Regulations, which covers the modalities of the registration exercise (a copy is attached as appendix A). Finally, the Act also clarifies how Ghanaians can guarantee their citizenship, in the case where a passport or birth certificate are unavailable. It states that at least two relatives, district assembly members or unit committee members, with proven citizenship, may vouch for the individual. Essentially, the bill aimed at declassifying the voter's identity card, driver's license and baptismal certificates as proof of citizenship. Again, the amendment provides further direction with regards to registering children under six 6 years old. Initially, the law registered only those five years and above, since biometric information (particularly fingerprints) are not fully developed till infants turn 6. However, the amendment makes provision for this by allowing the NIA to register children aged 0 -5 with unique identification numbers linked to that of their mothers at birth.[8]

2.1.2 Creation of National Database

Subsequently, having addressed the legal and regulation barriers, the creation of the national database to augment the identification process was contracted to the French company, Sagem Securite, following a tendering process that saw competition from Hewlett-Packard/Printrak,

NIKUV (Israel) and Marpless (South Africa). The contract entailed the design and development of Automated Fingerprint Identification System (AFIS) that would store fingerprint templates for authentication purposes and would then be transferred to the government after two years. Afterwards, the government would embark on a nationwide enrollment programme using mobile registration stations with a fingerprint and biographical data capturing equipment and issue a two-dimensional barcode plastic cards that would store encrypted fingerprint details of holders.[9]

The National Identification Authority was able to acquire over 1,510 Mobile Registration Workstations with chargers and batteries provided by the NIA's technical partner Sagem Security. Subsequently, a pilot registration exercise was held to test the functionality of the equipment, as well as the registration procedure outlined by the NIA. This exercise was held in two communities, Abokobi and Sege, in the Greater Accra Region, for 10 days from July 27 to August 4, 2007. Subsequent pilot projects were undertaken in the Central and Western regions in July 2008, followed by Eastern and Volta regions between August 2008 and July, 2009.[10]

On July 22, 2009, Dr. William Ahadzie was appointed as the Executive Secretary and CEO of the NIA, and under his tenure, the authority embarked on a mass registration exercise across the country. During that period, the NIA registered over 4 million Ghanaians, but the identity cards were to be issued and distributed on a later date. However, the NIA encountered financial and operational setbacks as the distribution of the cards was saddled with extra cost and the problem of locating the card owners. As a result, the NIA could not distribute over 2million of the printed cards and this development undermined the identification exercise. However, in 2012, Identity Management Systems (IDS), a subsidiary of Margins Group, made an unsolicited proposal to

register foreigners. In this regard, identity cards were issued to foreign nationals instantly upon the payment of a fee and that exercise has continued till date.[11]

Again, the issue of birth certificates, the required document to prove identities, emerged as a major obstacle to the registration exercise, coupled with large number of foreign nationals claiming dual nationality resulting from centuries of migration and fluid boundaries. Eventually, the government in most instances had to rely on relatives and community leaders to authenticate identities, resulting in long queues and inadequate stringent checks.[12]

Basically, the National Identification System (NIS) in Ghana is a Public-Private Partnership (PPP) agreement. The private sector provides the technical support, including the enrollment equipment and the government handles the organizational and the recruitment aspect. In terms of funding, the private sector and the government have invested over $169million and $124miliion respectively. The private company, Identity Management System, would recoup its financial losses in the future from the charges institutions such as banks and telecommunication companies would pay for verification of identities from the national identification database. The profits that would accrual from such charges would be shared 60-40 between the government and the private company.

The process of rolling out a national identification project is referred to as Identity Management which involves the issuance of cards, the technology adopted, the network and terminals (registration centers). The process involves enrollment, which is capturing biographic and demographic data of individuals; processing of the data through the Automatic Fingerprint

Identification System (AFIS) to ensure the data does not already exist in the database. Subsequently, the cards are printed and distributed.

2.1.3 Identification Ecosystem in Ghana

Regarding the identification ecosystem in Ghana, identification is most accurately characterized as decentralized. Different public and private bodies maintain specialized identification systems which cater for specific needs, with insufficient overlap. Currently, the major forms of recognized credentials in circulation are Birth Certificates, National Health Insurance Cards, Biometric Passports, Biometric Driver's Licenses, Biometric Voter Identity Cards, among others. There are certain criteria that should make any form of certification suitable as a national identification document, including the presence of biometric records, confirmation of citizenship and residence, legislation backing the issuance of the document, accessibility to all and adequate measures to prevent duplication, counterfeiting and fraud.[13]

However, for each of the available certificates of identification, they fall short of these conditions in one way or the other. The Birth Certificate is the primary form of identification in Ghana and is often used as a certificate of eligibility for the other forms of identification. However, for many Ghanaians, especially those born in rural areas with limited access to hospitals and registration office, the record of their birth and parenthood is often inaccurately documented.[14]

Though the passport and driver’s license are currently linked to biometric data and confirm citizenship, they are considered classed forms of identifications, for Ghanaians who are willing and able to either travel internationally or drive. The processes for acquiring these IDs are often

complicated, expensive and fraught with bureaucratic roadblocks. Without the intention to either travel or drive, there is little incentive to go through the trouble. This automatically creates a socio-economic barrier to identification, especially in the case of the poor and the uneducated.

The voter's ID and national health insurance cards are unique, in that they provide access to particular public services; electoral mandate and healthcare. The voter's identification card, though biometric, is restricted only to Ghanaians aged 18 and above, who are eligible to vote. At the 2016 presidential and parliamentary elections, only about 15 million voters, out of over 28 million Ghanaians obtained the voter ID. Again, the national health insurance card, also does not indicate whether the holder is a foreigner or not. Additionally, the fact that the card is subject to annual renewal, does not ensure its continued use as identification, in the event that an individual does not renew after expiration.[15]

Essentially, all these major credentials fall short in one way or the other to act as universal identification, hence the need for a verifiable biometric national identification card for which all Ghanaians are eligible for. Another main issue with each of the identification options described above is that the absence of an Integrated Database Management System to support verification of identity at each relevant institution.

2.1.4 Current State of National Identification System in Ghana

Having given the chronological events with regards to the history of national identification system in Ghana, the current state of the national ID project would also be reviewed. By May 2017, only

17% percent of residents had been registered by the NIA, representing about 4.5 million Ghanaians, leaving 83% unregistered.[16]

To address the discrepancies in the successive national identification projects in Ghana, President Nana Addo Dankwa Akufo-Addo, launched a National Identity Card, dubbed new "Ghana Card", at a ceremony held at the premises of the National Identification Authority, on September 15, 2017.[17] The Ghana Card initiative was espoused by the previous administration and that the new "Ghana Card" is a modification with biometric qualities.

Subsequently, the Vice President, Dr. Mahamudu Bawumia announced that government will commence the nationwide Identification registration exercise in November 2017 awaiting the digital addressing system but the date has been rescheduled multiple times.[18] However, the Executive Secretary of the NIA, during an interview with Citi News in November, 2017, disclosed that amendment to the National Identity Register Bill, 2017, was passed by Parliament under ' certificate of urgency and the corresponding Legislative Instrument (L.I) had been laid in Parliament, and that the commencement of the registration exercise will depend on the maturity of the L.I.[19] After the adoption of the new Act, voter's identity cards (IDs), drivers' license and baptismal certificates cannot be used as proof of citizenship but birth certificates and passport would be accepted. However, the Act has made provision for individuals who do not have birth certificates or passports to register. In this instance, two relatives or non-relatives, who are already bearers of the card, can vouch for the applicant under stringent checks.[20]

Currently, the NIA has commenced a pilot registration, starting from the government institutions and intends to embark on a mass registration on a later date. The Ghana Card, which uses biometric features for verification and authentication, would be used by holders for identification and also to access other government services including health delivery, passport acquisition, shipping and clearing of goods from the port, acquisition of Driver's License, receipt of bank services, registration of business, electoral registration, e-commerce and communication services, among others. The Ghana Card contains a 148K built-in chip which has 14 Applets which could be used by other government agencies like the NHIS and SNNIT. The features of the Ghana Card comply with International Civil Aviation Organization (ICAO) standards and the 2014 ECOWAS Protocol on national ID of member states to the effect that the IDs would be accepted as travelling document within the regional bloc.[21]

2.2 Overview of the Indian National Identification System

The issue of national identification gained prominence in the aftermath of the 1998 Kargil war between India and Pakistan, when the Kargil Review Committee was formed by the Indian Government to assess the state of national security. The Committee submitted its report to the then Prime Minister, Atal Bihari Vajpayee on 7th January 2000 and among the numerous recommendations was the proposal to issue identity cards to citizens in villages along the border regions and later to be extended to all individuals living in the border states.[22]

The other recommendations included the re-constitution of the National Security Council (NSC) and the appointment of a full time National Security Advisor who will submit periodic intelligence briefings to the cabinet, as well as improved border management, increased defense spending and

the revision of India's nuclear policy.[23] It was estimated that the Kargil war resulted in the death of over 527 Indians and a financial cost of approximately $2billion. This development generated media uproar and resurrected the debate over border protection, defense preparedness and illegal immigration.[24] As part of their work, the Kargil Committee invited the stakeholder institutions and members of the public with reliable information regarding the war. Subsequently, the 228-page report was submitted to the Indian Parliament on 25th February 2000. The committee observed in the report that the Kargil situation highlighted gross deficiencies in Indian's surveillance capabilities.[25] Following the submission of the report, the then Prime Minister on 17th April, 2000, approved the formation of Group of Ministers (GoM) under the chairmanship of the Home Minister, LK Advani, to study the Kargil Report and submit its recommendations within in six months.[26]

Eventually, the GoM submitted its report titled "Reforming the National Security System" to the Prime Minister on 26th February, 2001. In Chapter 5 section 110 of the report, the GoM identified illegal migration as a major threat to national security and recommended a compulsory registration of citizens and foreign nationals living in India. In this regard, the GoM proposed the issuance of a Multi-Purpose National Identity Card (MNIC) for all citizens and identity card with a different color and design would also be issued for non-citizens. Accordingly, the government gave approval for the pilot project of the MNIC in selected 13 districts from different regions including Karimganj from Assam and West Tripura from Tripura Regions.[27]

In April 2003, the MNIC project was initiated under the Citizenship Act, 1955 and, by May 26, 2007, the first card was issued in the Andhra Pradesh region. Earlier, the MNIC project

encountered various obstacles including the non-availability of data to establish the citizenship of individuals in the rural areas, especially for the landless laborers with no residential credentials and other operational deficiencies such as difficulties in capturing biometric data of users.[28]

Accordingly, the Indian government tasked a committee, "Eleventh Plan Working Group on Integrated Smart Card System" to make further proposals for the creation of a unique identification system. The group submitted its report to the government in January 2007. The Committee proposed the transformation of all different IDs into a single unique card by incorporating the biometric data of individuals on their smart cards.[29]

2.2.1 Unique Identification Authority of India (UIDAI)

In November 2008, the GoM established the Unique Identification Authority of India (UIDAI) to independently build a database containing the biometric information of all citizens. The National Identification Authority of India Bill, 2010, was introduced to support this development and the further creation of the Aadhaar number in 2010. Aadhaar, which means foundation or backbone in Hindi, is a 12-digit Unique Identification (UID) number.[30]

The UIDAI was mandated to issue UID numbers that could be verified and authenticated in an easy and cost-effective manner to all residents of India, with the aim of eliminating duplicate and fake identities. On 23rd June, 2009, the government appointed Nandan Nilekani, co-founder and former CEO of the global technology services firm, INFOSYS, as the chairman of the UIDAI, a position which was made equivalent in rank to a Cabinet minister. In April 2010, UIDAI launched

the logo and the brand name Aadhaar and the first UID number was issued on 29 September 2010.[31]

After years of judicial barriers as to the legality of the identification exercise, the Unique Identification Authority of India (UIDAI) gained statutory status under the provision of Aadhaar (Targeted Delivery of Financial and Other Subsidies, Benefits and Services) Act, 2016 passed on 12th July, 2016. The government attached the UIDAI to the Department of Electronics and Information Technology (DeitY) of the then Ministry of Communications and Information Technology. Under the Aadhaar Act 2016, UIDAI became responsible for the Aadhaar enrolment and authentication, in addition to operation and management of all stages of the Aadhaar life cycle, including the development of the policy, procedures for issuing Aadhaar numbers to users and also to ensure the security of identity information and authentication records of individuals.[32]

2.2.2 Identification Ecosystem in India

Much like Ghana's, India's identification ecosystem is pluralist, with much different documentation used and accepted as verification of identity. These include, but are not restricted to, the Aadhaar or UID number, the Indian passport, the Electoral Photo Identity Card supplied by the Election Commission of India, Overseas Passport, Overseas Citizen of India document, Birth Certificate, Driver's License and Permanent Account Number (PAN). The PAN was developed just before the Aadhaar and is the closest India came to widely-accessible national identification. It was first issued in 1972 by the Income Tax Office as a means of identifying taxpayers and linking them to their tax accounts.[33]

The PAN is a 10-character, alpha-numeric number which includes sequential alphabet and number series, as well as the first character of the holder's surname and their tax status. The use of the PAN extends to other non-tax financial operations including sale or purchase of property, opening a bank account, large-value contracts and, basically, all transactions that exceed stipulated rupee amounts.[34] Second to the Aadhaar in terms of enrollment, 243.7 million PANs had been issued as of February 2016.[35]

Similar to Ghana, there are the observed economic and social barriers to obtaining these different documents, especially for those that were linked to and acted as restrictions to specific social services and rights.

Legal Framework of UIDAI

Regarding the legal framework, the National Identification Authority of India Bill established the UIDAI in 2009 prior to the issuance of the Aadhaar in 2010. It defined the parameters within which the UIDAI could create and manage the UID database and issue the Aadhaar number. The law states that the Aadhaar is voluntary and every resident of India, citizen or not, is entitled to the Aadhaar number once they have provided biographic and demographic information. This information could be verified with any of the recognized identification documents available, or by the introduction of an Aadhaar holder known as the Introducer. It further states that Children under 5 years should be registered at birth by the Births and Deaths Commission and their information should be linked to their mother or father's demographic data.[36]

The law also mandated the UIDAI to develop, generate and preserve the security of the data collected. This was further ratified as The Aadhaar (Targeted Delivery of Financial and Other Subsidies, Benefits and Services) Act, 2016. The UIDAI is responsible for keeping the information confidential and required to take all necessary steps to prevent loss or unauthorized access to the data stored in the Central Identities Data Repository (CIDR). The UIDAI is forbidden from revealing the contents of the repository. The only instances where the UIDAI may grant third-party access to any information included when an Aadhaar holder gives written consent to the UIDAI and for authentication purposes, as well as national security concerns.[37] The governing board members of UIDAI was expected to have at least 10 years of experience in fields relating to the administration of national identification system and a renewable three-year tenure of office until they reach the age of sixty-five. The Central Government was responsible for the appointment and withdrawal of membership. The Act further outlined the functions and operations of the Authority. The Authority was responsible for determining, with Central Government approval, the number, nature and categories of auxiliary branches and offices, officers and recruitment of other employees of the Authority.[38]

UIDAI and Data Protection

Regarding data protection, Chapter VI of the Act addressed the issue of information security and authentication of records supplied by Aadhaar holders. The Act prohibited the sharing of biometric information, for any other function besides the issuance of the Aadhaar number and authentication. It further spelt out the process for managing and updating the records, which could only be done at the request and consent of the holder. Since a major objective of the UID initiative was to control and prevent falsification, impersonation or duplication, Chapter VI of the Act also spelt out clear

penalties for breaching the security of the CIDR or personal information, as well as attempting to undermine the integrity of the records. These include prison terms and fines related to the severity of the offense.[39]

The UIDAI is not permitted under the legislature to profile or track the activities of the registered individuals.[40] According to the Act, the number itself does not give any indication as to the characteristics of the holder. During registration, information about a person's race, religion, tribe, ethnicity, language, income or health are not collected or recorded.[41] Historically, having ready access to a person's membership to certain groups (especially ethnic and religious) has been known to put individuals at risk of discrimination, harm and even death. In the 1990s, identification cards in Rwanda included an ethnic group classification which, if it read 'Tutsi', placed a target on a holder's back during the civil war. During World War II, identification cards with the 'J-stamp' and yellow star of David badges were the basis on which families in Nazi Germany were shipped off to concentration camps. The randomization of the number is intended to protect the privacy of the holder.[42]

The UIDAI Registration and Authentication Processes

The process of registration was designed to be accessible for all residents and handled by UIDAI-authorized third-party registration agents. These agents can be Registrars (created solely for collecting information), Enrolment agencies (authorized by both UIDAI and Registrars to collect biometric information) and other institutions that provide public services and already collect data for their operations. Once the resident provides proof of identity and proof of address, the registration agents forward the information collected to the UIDAI for recording in the CIDR.

Upon collection and authentication of the submitted application, the UIDAI sends a letter to the agent and the resident with the new Aadhaar number provided. The UIDAI does not necessarily provide a card, as the number is enough to verify and authenticate identity once provided. However, the letter has a detachable portion with the Aadhaar number printed on it for the resident to laminate or keep. Additionally, other institutions can publish their own cards or documentation with the number printed on it, given the holders' permission.[43]

Residents are only expected to enroll once, but have the opportunity to update their demographic information, especially in the case of a change in address. Biometric information can only be changed (i) when a child turns five, (ii) if an individual has been involved in an accident or other incident which has altered their physical features or (iii) ten years after registration.

Nature and Scope of the UIDAI Identification System

The UIDAI identification system is composed of three Automated Biometric Identity Subsystems (ABIS) that run concurrently, and this aims to increase accuracy and reduces false match since enrollment could be verified against multiple biometric systems. The three ABIS are operated by outsourced Biometric Service Providers (BSPs), who maintain their own database of fingerprints and iris templates. The UIDAI assesses each ABIS on regular basis and the ones with efficient enrollment credentials are upgraded. Again, there is a UID middleware which serves as a layer between the three ABIS system which monitor accuracy and performance. Both the ABIS and UID Middleware reside in the Central Identity Repository (CIDR), which also contain the core and supporting applications. The composite system of enrollment ensures that only quality biometric images are captured, consistency checks are carried out and all biometrics recorded are unique.[44]

Again, to ensure the reliability and efficiency of the capturing devices, with regards to quality of images and interoperability requirements, the UIDAI has established a certification directorate, Standardization Testing and Quality Certification (STQC) under the Department of Information Technology to provide quality assurance and provisional certification.[45]

Regarding implementation, the Indian State and Union governments play a vital role in the enrollment programme. The UIDAI is solely responsible for establishing the standards and procedures for the enrollment, but it is the responsibility of the States and the Unions to recruit the enrollment officers and provide the needed resources for the exercise. The State departments sign MOUs with the UIDAI to confirm their commitment to uphold the standards and processes for verification and identification.[46]

Again, appointed Registrars, can in turn outsource the enrollment duties to an Enrolling Agency to carry out the enrollment exercise. The Enrolling Agencies' only collect demographic and biometric data citizens, and submit same to the Registrar, who in turn pass it on to the UIDAI Central ID Repository. The Enrolling Agencies are assessed on a 4-level technical and financial maturity test by the UIDAI before they can receive the eligibility certificate, referred to as Empanelment. Aa part of the criteria for the request of empanelment, an Enrolling Agency must be a company or organization, such as microfinance, Public Sector Units, an NGO, consortium of companies (4 maximum), which are registered in India and have operated for at least two years. Again, Enrolling Agencies must be non-denominational and non-political with no religious or political affiliations. As of December, 2011, the UIDAI had 174 empaneled enrollment agencies who were facilitating the enrollment exercise. It should be emphasized that the Enrolling Agencies

are paid for only successful captures and not the number of enrollments conducted.[47] Accordingly, flexible but strictly monitored enrollment procedures have accounted for the successful enrolment rate of the UID programme in India, which has already registered over 90% of the citizens and foreign nationals.[48]

Current State of National Identification in India

Currently, the UIDAI has registered over 1billion Indians and intends to capture all citizens by 2020. The registration exercise is ongoing and user's Aadhaar numbers have been linked to other government services including welfare benefits, gas rations, among others.[49]

2.3 Challenges in the Implementation of NIS in Ghana and India

In spite of the apparent benefits of National Identification System (NIS), there are significant barriers to successful implementation, sustaining its function and ensuring that the actual benefits are realized. The constraints are due to a variety of factors classified under political, institutional, technological, logistical or financial, social and legal. This section explores the different challenges that has played a role in stifling the progress of national identification schemes in both countries. It will further explore the policy efforts under the Aadhaar system that prevented or addressed the barriers. This will inform policy recommendations that could support the implementation of NIS in Ghana.

It could be emphasized that there had been challenges to the implementation of national identity systems in both Ghana and India, but the levels of accomplishment vary greatly between both countries. The Aadhaar identification system in India has registered over 1 billion of its citizens

since its introduction in 2009,[50] whereas the National Identification System established in 2006 in Ghana, is yet to fully register and issue national identification documentation to its population of 29 million. The disparity motivates the attempt of this analysis to compare and identify the factors that led to the successful enrollment of Indian residents, where over 76 percent are already registered and identify the barriers to finally completing the NIS which was introduced 3 years prior to the Aadhaar and establish whether the UID approach is suitable for the Ghana's social economic and political climate.

2.3.1 Implementation Challenges in Ghana

There are many different reasons for the failure of the initial national identification attempts and the delay in the ongoing exercise. These challenges are interconnected, and in many cases, one bottleneck is presumably the result of another.

Political

The primary challenge identified in the course of establishing national identification in Ghana was an imbalance in perceived political commitment. The process of vetting and selecting a system provider in 2003 took almost three years, delaying the biometric registration until Sagem Securite were contracted to provide the system needed to create the national database.[51] One of the grievances of the former CEO of NIA in 2014, Dr. Josiah Cobbah, was a shift in political interest in the registration exercise due to changes in government, thereby affecting the flow of financial support to the authority.

Financial and Logistics

The UIDAI has spent over 11.4 billion rupees (equivalent of $168million) on issuing the Aadhaar number from the beginning of 2018 to date,[52] while Ghana has allegedly spent over $ 50million on its identification project since 2009.[53] Initiatives such as national identification is capital-intensive and can only be successful through sustained funding. The NIA had issued over 2.7million cards by 2013 but only distributed 900,000cards due to the lack of logistics to deliver the cards to the registered owners. The issue of funding led the NIA in 2012 to enter into a controversial funding agreement with a Chinese firm which plunged the NIA into indebtedness in 2013.[54]

Institutional

In addition to financial and capital resources, institutional efficiency is key to the successful implementation of any government project. In the case of the NIA, the identification process requires smooth and efficient transfer of data from the enrolment stage, through the collation into the database and the timely issuance and distribution of the cards. However, institutional inefficiencies within the NIA set-up have also contributed to the woes of national identification in the country. For instance, the NIA started the collection of data in 2008, ahead of the set-up of the required central database. During this period, the data collected from 15million Ghanaians in all ten regions were stored on CD-ROMs for later extraction. However, during the integration of the data into the database, only 4.5 million could be uploaded onto the central database due to combination of poor quality and loss of data.[55]

Technology

The success of any national identification system relies greatly on the technology adopted. The enrolment, the storage of data, the interoperability, verification and authentication are all technology based. According, the system needs to be modern and upgradeable to suit changing policy and socio-economic trends. The initial identification technology provided by Sagem Security is considered obsolete as it lacks the needed features to meet current international standards of biometric capture and verification. It was therefore expected that after the first phase of registration, the system would be upgraded in 2009 but the NIA proceeded to issue over 2milliom 2-barcode cards, only to be replaced entirely after few years. Even the technology of the new Ghana Card had to be revised to accommodate the 2014 ECOWAS protocol requirement that allows for a coordinated and ease of recognition within the sub-region. An additional technological constraint is the absence of good addressing system that supports a geo-spatial framework or database.[56]

2.3.2 Implementation Challenges in India

The Indian Aadhaar project has also faced implementation challenges, mainly legal barriers and other issues with enrolment fraud and data leakage.

Legal barriers

The Indian government intended to link the Aadhaar project to the delivery of services and welfare schemes, but the initiative continues to face legal challenges. In September, 2013, the Indian Supreme Court issued an interim order to the effect that the government cannot deny services to citizens who do not possess Aadhaar numbers, as the identification project is voluntary. Again,

following claims from individuals, the Supreme Court on 11th August, 2015 ordered the government to publish in print and electronic media that the Aadhaar identification system is not mandatory for the delivery of welfare services. Accordingly, these legal bottlenecks continue to undermine the project since the linkage of the project to welfare scheme was seen as a motivating factor for enrolment.

Enrolment Errors and Fraud

Again, the validity of the Aadhaar number as a credible proof of citizenship has been questioned. In order to enhance accessibility and enrolment, the required documents for registration has been greatly simplified, resulting in cases where individuals can use false names to acquire Aadhaar numbers. For instance, the deputy director of UIDAI, in May 2013, confirmed there had been errors in the registration process as some users have received Aadhaar cards with wrong fingerprints and photographs. These incidences continue to undermine the integrity of the Aadhaar card as a credible identity.[57]

Data Leakage

The issues of data leakage continue to hamper implementation of national ID system in India. There had been several instances where Aadhaar data collected was leaked online, endangering the privacy of users. The UIDAI confirmed that over 200 government agencies published Aadhaar data online, exposing the records of over 135 million Indians.[58] In August 2017, Wikileaks published that the fingerprint and iris scanning equipment been used by the UIDAI in India came from the same American suppliers that collaborate with CIA and FBI on global terrorism issues.

Accordingly, the perception that foreign entities may hack and access the Aadhaar database serves as a disincentive to the implementation of the Aadhaar project.[59]

2.4 Conclusion

This chapter appraised the collective efforts made by successive governments in Ghana and India, with regards to the implementation of National identification system in the respective countries. The current state of identification projects in the case countries were reviewed and it emerged that India has succeeded in registering a significant number of its citizens within a stipulated time while Ghana is yet to register over 80 percent of the citizens. Accordingly, Ghana's ongoing identification project could draw lessons from the Indian experience with regards to the best practices and the identified weaknesses in the system.

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CHAPTER THREE

ANALYSIS OF THE RESEARCH FINDINGS

3.0 Introduction

This chapter presents analysis of the data gathered from the interviews conducted with the key stakeholders of national identification system in Ghana to address the objective of this study based on the research questions. I also utilized secondary data on national identification system in India to deduce the lessons Ghana can draw from the Indian experience.

3.1 The need and benefits of national Identification in Ghana

The national identification register is the outcome of National Identity Register Act, 2008 (Act 750) and amended in 2017 which empowers the NIA to register and enroll all citizens and foreign nationals' resident in Ghana.[1] The identification exercise goes beyond collection of biographic and biometric details of citizens and foreigners' residents in Ghana by capturing other relevant and institutional details such as voter details, passport details, driver and vehicle licensing details, tax identification details and national health details.[2]

According to the Head of Statistics Department of the University of Ghana, every country needs statistical data on the population for planning purposes. *The issuance of unique IDs for citizens also helps to reduce corruption and fraud with regards to the delivery of services. For example, the incidence of ghost names, where government officials intentionally overpopulate the salary scheme, constitute a financial drain on the government and this development could be rectified with unique personal identification numbers (R7).* In the same vein, an official from the Passport

Office in Ghana also reiterated that the national identification will ensure the creation of central database with biometric and demographic data of citizens and such information will aid in economic planning, combating of crimes and other fraudulent activities, as well as serving as a source for identity verification.

The Deputy Director of Criminal Investigation Department (CID) was also of the view that national database of biometric information of citizens is very essential in the fight against organized crime, terrorism, human trafficking, and armed robbery, among others as it enhances investigation by providing the medium where identities of suspects could be verified. To buttress this, the Deputy Director of Interpol Division of the Ghana Police posited that *the national identification system will help with the tracing of crime suspects in the country. If a country does not have an accurate national database containing the biometric information of individuals, it makes it difficult if not impossible to trace Ghanaian suspects captured in the database of the International Criminal Police Organization (INTERPOL) R2.*

More so, an official from Bureau of National Investigation (BNI) argued *that there is the need for a comprehensive, robust and accurate national identity system to enable the government to effectively and efficiently plan and develop the country(R3)*. For security agencies, there will be a substantial reduction in the chances of multiple identities of unscrupulous individuals due to the creation of a centralized biometric and biographic database. He further suggested that such an exercise will lead to a reduction in the chances of identity theft and impersonations due to biometric verification and validation of the NIS as well as easy tracking of persons under security notice. With a reduction in multiple identities and identity theft, state security agencies will be able to

track and trail (travel history, bank and financial transactions trails, mobile phone usage, etc.) individuals who come under security notice. *There will be a substantial decrease in anonymity-based Crime such as mobile money fraud which flourish in an environment with incoherent, unreliable, unmanaged and disseminated database such as birth and death registry, sim card registration, drivers' and vehicles' license (R3).* For example, the increase in mobile money fraud where perpetuators use preregistered sim cards usually with wrong user registered details as a safe haven to avoid detection and tracing by security agencies will reduce substantially. *The state needs a secure identification system to perform core functions and administer programs and services vital for development in security, economic, education, healthcare, and emergency and disaster response in the country(R3)*

The Head of Political Science Department of the University of Ghana also shared similar view that *the need for NIS is to be able to identify Ghanaians and foreign nationals' resident in the country* (*R3*). The Ghana card, the name given to the new ID is expected to replace any other form of Identification currently being used in the country to verify citizenship.

The respondents interviewed in the public sector indicated that adequate, relevant and reliable information is extremely important in the public policy making process. This is because the policy maker and analyst who has access to information is able to make projections and predictions that can help solve the problems confronting society at any given time. Similarly, any person seeking to investigate the causes, consequences and performance of public policies and programmes can create the requisite knowledge only on the basis of the quality of information before him or her. Ghana like many other African countries generally suffers from adequate and reliable information

on which to build policy. In this respect, where there is shortage of data as this study establishes, policy outcomes are typically not responsive to the issues targeted in the first place. This is because policy makers are compelled to rely on intuition and experience instead of on accurate data. A national identification system will help in evidenced-based policy making.

In an extensive discussion on the importance of the NIS to crime prevention and control, respondents from Ghana INTERPOL and CID, indicated that criminals often leave behind vital but "invisible" information about their identities at the crime scene. This often takes the form of fingerprints and hair samples. Occasionally, they also leave behind skin and blood samples, especially in violent crimes in which a physical struggle ensues between the criminal and the victim. However, without a national database containing the biographic and demographic information of citizens, it becomes nearly impossible for security agencies to apprehend perpetrators based on information obtained from the crime scene. Accordingly, the introduction of the NIS will help eliminate that problem. It follows from the foregoing that a strong, well-constructed and effectively networked national repository of information about personal identity has a potentially beneficial role to play in combating various forms of crime in society, or at minimum, in properly identifying and responding to different classes of criminals, namely: (a) first-time offenders; (b) repeat offenders or suspects who are ex-convicts; and (c) fugitives from justice.

Another case for establishing a national identification system is the need to support the protection and consolidation of democracy. *It needs to be noted that a poorly implemented NIS undermines the stability of the state (R4).* The Head of the Political Science Department illustrated this with

the situation that occurred in the Côte d'Ivoire a few years ago when out of disenchantment with the use and abuse of the identity card the country was ushered into political crisis.[3] The NIS, will therefore, ensure the creation of a national database that could be utilized for voter registration purposes.

He further contended that arguments about the presence of "foreigners" in the Voters' Register created political tensions in the run-up to the 2016 elections and as such the issue establishes a strong case for the compilation of a credible, legitimate and universally acceptable electoral roll that draws data from an accurate and trusted national identification database. The Head of Statistics Department also emphasized that Voter identification during voting exercises can be facilitated within the context of a functioning national identification system. Multiple registrations by individuals and other kinds of electoral fraud can easily be detected and prevented. The real time identification capability feature of a NIS will greatly aid fast and positive verification of a voter's identity and thus facilitate the exercise of the right to vote without let.

The former CEO of NIA emphasized the importance of NIS in enhancing education in the country. The education system in Ghana is fraught with number of challenges. Indeed, the new policy of free senior high school for all eligible Ghanaians has introduced a huge challenge of targeting and financing. He therefore argued that the challenges in the education system, can be overcome within a functioning national identification system. *An identification system provides the basis for differentiating intra-sectoral needs and therefore pro-rating resources accordingly. Again, examination fraud, misuse of one's certificate or of other people's certificates will be minimized if not eliminated (R8)*

The Head of Political Science Department reiterated that *the vision of decentralization and the strategies formulated cannot be realized without the provision of more reliable population census data and information for national development which the NIS seeks to do* (*R4).* He therefore argued that the information provided by the NIS will be very critical to the operations of the Metropolitan, Municipal and District assemblies (MMDAs).

3.2 The Challenges to the implementation of National Identification System in Ghana

According to the Director of Corporate Affairs at the NIA, the major challenge had to do with the distribution of the cards. As per the earlier arrangement, the NIA conducted mass enrollment and later printed the cards for distribution, instead of issuing the cards instantly. This arrangement inflated the cost of the project as different personnel were recruited for the distribution exercise. *The NIA has over 2million cards which could not be distributed due to logistics problems and difficulties in locating the owners* (*R6*). Accordingly, all these flaws in the arrangement increased the financial burden of the government and occasioned public displeasure in the whole national identification project. Head, Statistics Department at the University of Ghana equally suggested *that there is difficulty in identifying individuals through their addresses due to lack of updates on demographic data (R7)*. This resulted in the stockpile of IDs which could not be distributed. Again, lack of funding also undermines the NIS project.

Former Executive Secretary of NIA pointed out that there are two types of enrollment. These are mass registration and continuing registration. The previous NIS in Ghana was referred to as Identity Management which involves the mass registration to populate the database and ID cards are issued after the data has been processed. The challenge with this system is the distribution of

the cards. The current NIS is called the Real Time Card issuance, where enrollment and printing of cards occur instantly. In this instance, biometric and demographic data of individuals are processed through the AFIS to ensure uniqueness before printing of the cards. The enrollment centers connect to the AFIS through internet connectivity. However, the NIA depends on other telecommunication companies for its network. Accordingly, in the event that there are network fluctuations due to poor connectivity or weather, it would affect the rate of enrollment, resulting in long queues and delays. *Again, all the numerous enrollment centers (27,000 in Accra only) would be processing data simultaneously from the same AFIS which may lead to integration problems and grumbling of data, resulting in enrollment problems, which in turn would undermine the mass registration exercise (R8*).

According to the Deputy Director of Passports, the lack of central database for national identification is the major cause of identity theft and impersonation because the requirements for passport acquisition could be obtained easily without any verification procedure. *For example, birth certificates are issued based on the information given by the beneficiary without any means of verification (R9).*

Deputy Director of CID indicated that the absence of reliable identification system hinders investigation as there are no means of verification of biometric details captured from crime scenes. During investigations, identities of suspects could be verified from service delivery institutions like the mobile networks, DVLA, passport office, among others but it takes a considerable time to obtain the required information from these institutions due to bureaucracy and other administrative obstacles. Sometimes the Police needs an order from the court to get information on suspects from

institutions such as the mobile networks and all these could obstruct justice by delaying investigations. Furthermore, the data on individuals captured by respective institutions are insufficient and more often inaccurate. *The police CID have the EFAX system which contains the data of all persons convicted by a competent court, but it is insufficient since it captures the data of only individuals who are serving jail terms (R1).*

Furthermore, an official from the Interpol hinted that the information that Ghanaians in diaspora are using abroad are different from their real identities back home. For instance, most of the documentations retrieved from Ghanaian suspects are forged, making it difficult for INTERPOL Ghana to investigate international suspects.

3.3 Lessons Ghana can draw from the Indian experience

One of the objectives of the study was to find out the nature of the Indian identification system and lessons Ghana can learn from their experience. The study revealed that the Aadhaar is estimated to cost over US$3.4billion and aims at issuing personal identification numbers referred to as Aadhaar numbers to all citizens of India.[4] It is cost effective because it is not necessarily a card-based identification system. Just the Aadhaar number is sufficient for verification and authentication.[5] According to the Commercial and Technical attaché at the Indian High Commission in Ghana, *the UID identification system is composed of three Automated Biometric Identity Subsystems (ABIS) that run concurrently and this aim to increase accuracy and reduce false match since enrollment could be verified against multiple biometric systems. The three ABIS are operated by outsourced Biometric Service Providers (BSPs), who maintain their own database of fingerprints and iris templates* (*R5*). The UIDAI assesses each ABIS on regular basis and the

ones with efficient enrollment credentials are upgraded. Again, there is a UID middleware which serves as a layer between the three ABIS system which monitor accuracy and performance. Both the ABIS and UID Middleware reside in the Central Identity Repository (CIDR), which also contain the core and supporting applications. *The composite system of enrollment ensures that only quality biometric images are captured, consistency checks are carried out and all biometrics record are unique(R5).*

Again, to ensure the reliability and efficiency of the capturing devices, with regards to quality of images and interoperability requirements, the UIDAI has established a certification directorate, Standardization Testing and Quality Certification (STQC) under the Department of Information Technology to provide quality assurance and provisional certification.[6]

To ensure effective implementation, the central and union governments play a vital role in the enrollment program. The UIDAI is solely responsible for establishing the standards and procedures for the enrollment, but it is the responsibility of the states and the unions to recruit the enrollment officers and provide the needed resources for the exercise. The state departments sign MoUs with the UIDAI to confirm their commitment to uphold the standards and processes for verification and identification.[7]

Again, appointed registrars, can in turn outsource the enrollment duties to an enrolling agency to carry out the enrollment exercise. The enrolling Agencies' only collect demographic and biometric data citizens, and submit same to the registrar, who in turn passes it on to the UIDAI central ID repository. The enrolling agencies are assessed on a 4-level technical and financial maturity test

by the UIDAI before they can receive the eligibility certificate, referred to as Empanelment. As part of the criteria for the request of empanelment, an enrolling agency must be a company or organization, such as microfinance, public sector units, an NGO, consortium of companies (4 maximum), which are registered in India and have operated for at least two years. Again, enrolling agencies must be non-denominational and non-political with no religious or political affiliations. As of December, 2011, the UIDAI had 174 empaneled enrollment agencies which were to facilitate the enrollment exercise. It should be emphasized that the Enrolling Agencies are paid for only successful captures and not the number of enrollments conducted. Accordingly, flexible but strictly monitored enrollment procedures have accounted for the successful enrolment rate of the UID program in India, which has already registered over 90% of the citizens and foreign nationals.[8]

On the issue of what necessitated National identification in India, the key informant, emphasized that the government of India spends so much on social programmes to improve conditions of life of its citizens. The absence of reliable data has been identified as a major concern. The Unique identification program initiated by the Unique Identification Authority in India (UIDAI) in 2009 therefore aims to improve government delivery of services, enhance security, reduce corruption and fraud, among others. For instance, India's subsidy programs amount to approximately 14 % of the GDP. From 2011-2012, the Indian government allocated $10 billion for fertilizer subsidies, $ 12 billion and $4.5 billion subsidies on food and petroleum respectively.[9]

However, the lack of unique identification system resulted in grave corruption and fraudulent activities in the allocation of subsidies, as the subsidies fail to reach the intended beneficiaries. For example, a 2008 Planning Committee report revealed that over 37% of grains allocated for

poor households ended up in the open market and 58% of subsidized grain did not reach the intended beneficiaries due to lack of identification.[10] Therefore, the issuance of the unique identification numbers has helped to reduce cases of corruption, thus saving the government vital resources that would be invested in other developmental initiatives.

Regarding the flaws in the Indian Identification System, the Commercial and Technical attaché at the Indian High Commission in Ghana indicated that *the Indian national identification system only provides citizens with numbers and not cards(R5)*. This is one of the flaws in the system since individuals expect to have a physical card after enrollment and it also makes identification more convenient since there could be instances where users can forget their Aadhaar numbers.

Again, the Central Identity Repository (CIDR) which contains the backend database is managed by three non-Indian outsourced Biometric Service Providers and this could be a source of threat to the national database. This arrangement was put in place to initially lessen the burden of the UIDAI as there was a long-term plan by the government to create a state-controlled system integrator to manage the CIDR but there had been a delay due to budgetary constraints (Personal Commission).[11]

3.4 Measures for ensuring sustainability of a national identification program in Ghana

According to a Deputy Director of CID, *the government should provide the needed funding for effective implementation since the existing piecemeal approach is not only inefficient but also costly (R1)*. The system should concurrently capture the biometric data of new born babies to enhance the accuracy of the national database since the source of most of the required document

needed for the national identification are questionable. The data should include fingerprints and other unique biometric characteristics. The biometric data should capture sufficient information about individuals which could be used by other state institutions to avoid overlapping of multiple identity cards. The database should be updated periodically to cater for relocations, change of names and other vital details. The national identification system should be highly decentralized to enable easy access for enrolment. The identification system should be highly efficient in terms of verification to serve the intended purpose. The government can use the database as a source of revenue from organizations and institutions that use it for verification purposes. This revenue could be used for maintaining and updating the database.

In the view of the official of Interpol, the national identification numbers should be given from birth and it should be the basic requirement to procure all other documents in Ghana to ensure consistency in the identification database. Director of BNI suggested that the NIS system can be modeled into a one stop shop for statutory identification. With few exceptions such as an ECOWAS Passport, the NIA can accelerate its efforts on the integration of all other identification systems in the country. *The NIA must ensure that the necessary legislations and constitutional amendments are tabled before the appropriate institutions such as parliament to enable the authority to lawfully integrate all IDs in Ghana and to serve as an interface to other forms of IS database from other institution into the NIS (R2)*

The NIA owes the state the duty to ensure biographic and biometric data are verified and crossed checked. In as much as much as there are inaccuracies in various databases in the country, the NIS must be able to provide a reliable, accurate and valid data to the various stakeholders or

institutions when needed. This can be done by vetting and cross searching biometric details of the populace in other forms of databases. For example, the NIA can cross check biometric data collected during the incoming exercise against other biometric data base such as the Voters register, the National Health Insurance Database, Social security and national insurance trust to check the validity of the data collected.

Respondents therefore called for stringent enforcement of laws as well as the admittance of punishment to persons who violate any aspect of the law on the NIS to serve as deterrent to person(s) intending to or engaged in any form of NIS irregularity or illegality. Director of Corporate Affairs at NIA indicated that sustainability of the NIS depends largely on funding. Accordingly, measures should be put in place to ensure the speedy population of the national database. Again, there should be regulations to link all government services to the NIA database and charges should be instituted for all private organizations that uses the NIA database for verification of identities. Again, the government should put up the necessary measures to start the enrollment from birth to curtail the complexities of establishing the identities of the citizens.

Former Executive Secretary of NIA, Dr. William Ahadzie, also emphasized that to ensure long-term sustainability of NIS in Ghana, is to first populate the national database through a convenient and low-cost mass registration exercise like that of the Indian identification system where requirements for enrollment and accessibility have been simplified to increase the rate of enrollment. The current system uses advance technology that relies on internet connectivity to process data and there is the likelihood of network and equipment failures that would undermine the mass registration exercise. Accordingly, it would be convenient to revert to the 2-barcode

enrolment arrangement which is manual without any network connectivity to be able to register as many people as possible to populate the national database just like the Indian experience where the system issues only numbers without cards. Again, the requirements should also be revised to increase the number of people who are eligible for the registration because of the time constraints of such exercise. The Head of Political Science Department also counselled that there should be adequate funding and sustained public education through elite consensus on implementation of national ID devoid of political biases, by involving renowned individuals to promote the acceptability of the programme.

Lastly, most of the respondents contended that registration of citizens from birth is fundamental in sustaining any national identification project in Ghana. For instance, as the government continues to embark on enrollment exercise, thousands of new born babies remain unregistered, a development that would undermine the objectives of the ongoing exercise.

3.5 Conclusion

The data gathered through interviews were analyzed and the views of the respondents on the research questions were presented. The opinions gathered were in conformity with the national identification obstacles and prospects identified in the literature review.

ENDNOTES

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CHAPTER FOUR

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

4.0 Introduction

This chapter captures the summary of the findings based on the objective of the research, conclusion and recommendations deduced from opinions of respondents and data from secondary sources.

4.1 Summary of Findings

The study revealed that the Indian Identification System which is called the Aadhaar is estimated to cost over US$3.4 billion, with the objective of issuing personal identification numbers referred to as Aadhaar numbers to all citizens of India. Again, the Aadhaar is cost effective because it is not necessarily a card-based identification system, but rather the issuance of identification numbers to the citizens. The UID identification system is composed of three Automated Biometric Identity Subsystems (ABIS) that run concurrently, and this aimed at increasing accuracy to reduce false match since enrollment could be verified against multiple biometric systems.

The underlying hypothesis in chapter one was that the successful outcome of the ongoing national identification programme in Ghana would depend greatly on sustained funding, improved participation and political commitment. This hypothesis agrees with findings that the national identification system in Ghana is a Public-Private Partnership (PPP) agreement, where the private sector provides the technical support, including the enrollment equipment while the government

handles the organizational and the recruitment aspect. In terms of funding, the private sector and the government have invested over $169 million and $124 million respectively.

Again, the IDs in Ghana involve the issuance of cards. The process involves enrollment, which is capturing biographic and demographic data of individuals; processing of the data through the Automatic Fingerprint Identification System (AFIS) to ensure there is no duplication of identity Another finding from the study showed that to ensure effective implementation, the Indian government has divided responsibilities of the national identification system between the central and the union governments. This is also to ensure the involvement and participation of the people at the local government level, rather than purely centralizes system detached from the people.

The study further revealed that the Indian Unique Identification Authority decided to outsource some of the critical services to which they were short of expertise. Again, it was also to help reduce cost of the project as it helped them reduce the employees they would have employed if all services were to be performed by the authority. More so, the study revealed that the Indian Aadhaar system had sufficient legislative protection coupled with consent, secondary usage, and health privacy making it a prominent challenge to the Indian digital identification systems. Besides, the country is also struggling to reconcile protection policy for its citizens on the one hand and data protection on the other hand. On the contrary, the Ghana identification system provides for the protection of data for its citizens as there is enough legislative backing. However, critics are of the view that the government can utilize the system to target opposition elements to pursue political agendas.

Regarding the need and benefits of NIS, the study revealed that a National Identification System which ensures the creation of central database containing the biometric and demographic data of citizens, is vital for economic planning, combating of crimes, enhancing education, strengthening democracy through the provision of credible voter register, as well as improving decentralization efforts.

In identifying the challenges to the implementation of NIS in Ghana, the study highlighted the pluralist nature of national identification in Ghana remains a major challenge. Since the inception of identification schemes in Ghana and India, multiple identification certificates have hindered accurate and trustworthy identification verification. Again, lack of political commitment was identified as a major obstacle to the implementation of NIS in Ghana. It was revealed that the nature and mode of implementation of NIS goes through massive transformations when there is a change in government. For instance, millions of ID cards printed by the previous administration are now invalid due to the introduction of new features. According, the research uncovered that the lack of consensus in the adoption of NIS policies will continue to hinder its implementation. For example, the main opposition NDC, continues to complain about the requirements for enrollment, suggesting that there could be a variation in NIS policies and requirement, in the event that the former return to power.

Akin to lack of political commitment is the issue of funding. The study revealed that insufficient funding also accounts for the poor implementation of NIS projects in Ghana. On the other hand, it was identified that sustained funding and political commitment resulted in the successful implementation of Identification system in India.

The study uncovered numerous lessons that Ghana can learn from the Indian experience. The Indians are using less sophisticated methods to populate the national database enabling them to enroll at a faster rate as compared to our current system that takes hours to capture the data of users. In terms of funding, the Indian system is cost-effective since it only involves the generation of Aadhaar number as compared to the expensive chip imbedded ID system currently been pursued by the government. More importantly, Indian has embarked on registration at birth to facilitate the integration of children into the National Identification project.

Again, India has outsourced enrollment to agents who are paid based on the quality of data captured, a scenario which does only reduce the administrative burden on the government but also provide convenience means for citizens to register. Furthermore, Indian has also linked the National Identification to service delivery, and users are mandated to provide Aaadhaar numbers to access services such as acquisition of travelling document, opening of bank accounts, school enrollment and other government benefits, and this has ensured citizens' participation in the NIS project. Lastly, the Indians have adopted legislations that ensure continuity of the project by successive governments through consensus with relevant stakeholders.

Regarding the issue of sustainable measures, the study through the opinions of respondents, identified enhanced political commitment, sustained funding , registration at birth, outsourcing of technical components to reduce burden on government, enhanced training of NIA personnel, linking of NIS to service delivery to ensure participation and the adoption of less expensive

methods of enrollment to populate the national database, while ensuring convenient means of registration to enhance citizen participation.

4.2 Conclusion

Based on the findings of the research, there is the need for a comprehensive, robust and accurate national identity system to enable the government to effectively and efficiently plan and develop the country. For security agencies, there will be a substantial reduction in the chances of multiple identities of unscrupulous individuals due to the creation of a centralized biometric and biographic database and this exercise will lead to a reduction in the chances of identity theft and impersonations due to biometric verification and validation of the NIS as well as easy tracking of persons under security notice, especially in this era where terrorism remains a major regional and global threat. However, the above could be achieved through enhanced political commitment and sustained funding, as well as ensuring the continuity of the project consensus building. More importantly, the creation of credible national database is vital for the successful implementation of any National Identification System and as such the NIA should adopt policies that ensure convenient enrollment to enhance citizens' participation.

4.3 Recommendations

Based recommendations from respondents (check Appendix 2), secondary data on Indian Identification project and literature exploring potential and realized bottlenecks to national identification in Ghana, the following recommendations were proposed:

- *Sticking to the Schedule*

All the challenges listed above combined to create a vicious cycle, where they delayed the NIS registration process, further exacerbating the challenges, thereby prolonging the delay. As indicated in the previous chapters, only 17 percent of residents had been registered by the NIA as at May, 2017, representing about 4.5 million Ghanaians.[1] This has led to a general mistrust of the system among Ghanaians and eventual failure of the initiative. A key objective of this attempt should be a timely administering of the cards. It was reported that the NIA intends to issue instant cards, unlike in the first round. This is a first step of making the cards more tangible to Ghanaians and building their trust in the system. Additionally, the intended registration schedule should be made available to the public and adhered to strictly. Deviations from the schedule should be communicated to relevant parties immediately.

- *Political commitment*

In spite of the urgency attached to national identification, it is a long-term continuous program, which, given the trends of political regimes in the past, will definitely see different political parties take office over its lifetime. We are aware that the constant interruptions of projects with political activity have very little positive implications over time. Often, it leads to the abandonment of projects in favour of the interest du jour, without any consideration for initial investments. Not only is this imprudent use of Ghana's financial resources, it goes further to reduce the trust Ghanaians have in the government and the NIA. For the NIA, the continuation of its function should be surpassed political interests and political commitment should be legally backed, save for periodic review of objectives and activities and audits of resource use. This should be done using results frameworks that can inform new governments of the state of their operations and uncover

any misuse of resources, thereby preserving transparency and accountability of the authority. In India, the UIDAI has seen two Prime Ministers in its lifetime without interruption to its functions or financial resource provision.

- *Consistent Reliable Financing*

Increasing access to identification has positive implications for social and economic functions in Ghana, especially in the arena of dispensing important public services, policy formation and raising the efficiency of public and private institutions. The outcomes of a strong, protected and well-managed identification database make the system a worthy investment and it should be a priority in the public budget. Ensuring that the NIS is consistently and transparently well-funded, will ensure the timely administrating of NIA's functions and the registration process, which will allow for them to surmount the initial capital-intensive process of registering all Ghanaians. After that initial stage, subsequent registrations can be managed on fewer funds, as the NIA continues to conceptualize efficient ways to reduce the cost variable costs of registration.

National identification has implications for national security. A database of sensitive private biometric information of all Ghanaians should only be controlled by the state, who should have the best interest of Ghanaians at heart. In 2012, when the NIA sought funding to continue operations, it is unclear what level of vulnerability they were exposed to via the debt agreement with private sector funding from China. While it is likely that the collaboration was benevolent, if the NIA has to resort to more private sector financing options, it is likely that this security will be weakened over time. Consistent financing will prevent this from occurring frequently or, at least,

allow for a stronger negotiating position regarding data protection, on the rare occasion that it occurs.

Further, the NIA should take steps to develop revenue generating strategies to become self-sufficient in the future. Two approaches should be considered; (1) Using verification service as means of generating revenue and (2) Increasing efficiency to lower cost. One respondent offers the example of the Aadhaar process which requires simplified requirements at enrolment.[2] .As mentioned in the overview of the Aadhaar in India, an objective of the system was to make the identification accessible to all people, especially the poor, hence the simplified approach. It is imperative that the NIA adopts this objective as well.

- *Institutional strength*

Data management is no easy feat and the process of recording biometric information for over 27 million people requires strong institutional capability related to technical skills, infrastructure, established operational standards and guidelines and the ability to adapt to changing social political and economic climates. While the physical infrastructure is dependent on financial resources, the other features of institutional capacity are reliant on a human factor. The selection of the right equipment, proper data collection and management protocols and so on are dependent on the qualifications of the NIA personnel in both management and staff. In the 2008 registration attempt, it was uncovered that a significant portion of the registered data was corrupted or lost and the printed cards could not be distributed. There needs to be a comprehensive strategy for supporting the NIA and expanding its capacity. Personnel at all levels should have data management skills and should be trained regularly as modern methods and technology are introduced.

In the case of the Aadhaar system, the UIDAI not only employs official registration centers, but allows public institutions to collect data on their behalf during their functions which is sent to the UIDAI to vet and populate into the central database. Only the UIDAI is lawfully allowed to issue Aadhaar, however the use of locally established third party offices allows them to expand capacity without the corresponding cost of building physical infrastructure nationwide. In the case of Ghana, the institutions that already collect data, such as the DVLA, NHIA, hospitals and so on, can act as pseudo-registration centres. Additionally, using these avenues will lead to unification of identity in Ghana and further promote interoperability.

- *Communication*

Furthermore, communication among institutional stakeholders and between the NIA and the general public is crucial for the success of the programs and the enforcement of public trust, which supports public cooperation and participation in the registration activity. The NIA website and e-portals should be designed to be intuitive and accessible to the most basic web-user. Additionally, constant, recurrent messaging should be produced on media platforms such as the radio, television, and newspapers to inform Ghanaians of the NIA's functions, the registration, their rights in relation to data collection and identity authentication and the ways in which to access, update and replace lost ID cards.

- *Technology*

There needs to be extensive vetting the proposed database system for collecting and storing biometric data. It should be established that the proposed technology supports the modern identification database needs and is adaptable to future development and policy relevance. Since

it has been established that other institutions have managed to develop their own identification systems, the opportunity to explore their functions and adopt their key features that would improve the NIA's. For instance, the Navis system, used by the NHIS, allows for real-time access by healthcare professional.

Additionally, the NIA should incorporate mobile technology into its operations. About 19.53 million Ghanaians have mobile access in all regions of Ghana and this form of access can be used as a tool for sharing information, updating data and tracking status of registration.[3] In the Aadhaar system, correspondence is sent via text messages to the card-holder. The individual can request their Aadhaar number via the phone numbers provided at registration and control who can view their information via that forum as well. While, in Ghana, mobile internet is not uniformly accessible, text and call technology are more so. Short codes and SMS messaging can support the adoption of mobiles in national identification registration and data management.

- *Legislative review*

All the institutions that will interact with individual data should have their respective ruling legislature updated to include guidelines on their interactions with biometric data and restrict independent access to it outside of the permissions granted by the NIA. Not only will this encourage citizens to trust the state with their personal information, it will enable control over the dissemination of data and the opportunity to assign responsibility in the instance of data security breach.

In summary:

- Sufficient and committed funding should be provided to ensure the foundational processes are established.
- There should be political commitment, regardless of regime to prevent premature termination of the project, which is detrimental to its success.
- Institutional collaboration between the NIA and other institutions. which will allow for seamless linkage of database and identity verification and operational support.
- At-birth registration.
- Adoption of technology (especially mobile technology) to make the NIA more efficient.
- Legislative review for all data-collecting bodies to ensure the mandate of the NIA and protect personal information from unscrupulous or criminal use.
- Public education to improve awareness and ensure societal support.
- Adoption of convenient enrollment methods to ensure citizens' participation.
- Outsource of technical components to reduce the administrative burden on government.
- Adoption of cost-effect procedures to ensure financial sustainability.
- Constant training for NIA personnel.
- Linking of the National Identification project to service delivery.
- Making the Ghana Card the mandatory requirement for the acquisition of other national documents such as passport, driving license etc.
- Finally, the NIS project should be number-based like the Aadhaar in India and Social Security Number in United States of America. In this regard, a citizen's identification number will be quoted on all other national documents.

ENDNOTES

[1] BFTOnline. (2017, May 10). The Business and Financial Times Online. Retrieved from BFT Online: https://thebftonline.com/archive/more.php?ID=24372, accessed on14th July, 2018.

[2] Key informant interview, R9

[3] Graphic Online (2018, February 19). Over 10 Million Ghanaians Use the Internet-Report. Retrieved from Business Ghana: https://www.businessghana.com/site/news/general/159800/Over-10-million-Ghanaians-use-the-internet-Report, accessed on14th July, 2018.

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APPENDICES

APPENDIX I

Table 1: Coding Frequency Table for Needs and Challenges of NIS

Themes	R1	R2	R3	R4	R5	R6	R7	R8	R9	Total
Need for NIS/NIA										
General Identification of persons	*	*		*			*	*	*	6
Security and crime prevention										
- Identification and verification of criminals	*	*	*				*			4
- Forensics and investigation	*	*	*							3
- prevent corruption fraud, forgery and impersonation	*	*	*		*		*		*	6
Replacement of multiple IDs	*	*	*				*		*	5
Development planning			*	*			*	*	*	5
Public service delivery			*		*		*	*	*	5
Challenges to NIS/ NIA										
Hinders investigation.	*	*	*					*		4
Institutional inefficiency										
- Insufficient, inaccurate, forged and false data	*	*	*				*	*	*	6
- Multiple databases	*	*	*		*		*	*	*	7
- delayed authentication	*	*	*					*	*	5
- inefficiency of NIA (logistics, database, enrollment access etc.)		*	*			*	*	*		5
- Absence of addressing system to support	*	*	*			*	*	*	*	7
Lack of objective political commitment				*		*		*	*	4
Lack of public awareness				*		*	*	*		4
Lack of funding			*	*		*	*	*		5

Appendix II

Table 2: Thematic Framework for Needs and Challenges of NIS

Global theme	Organizing theme	Basic theme	Definition	Frequency	Quotes
Need for NIA/NIS	Identification and verification		Ability to authenticate identity	3	"…identification system should be highly efficient in terms of verification…" – R1 "To be able to identify Ghanaians and foreign national resident in the country."- R4 "…serving as a source for identity verification"- R8
	Security and Crime Prevention	Identification of criminals	Ability to identify criminals' home and abroad	3	"…identities of suspects could be verified…" – R1 "…help the tracing of crime suspects…" – R2 "Easy tracking of persons under security notice." – R3
		Investigation and Forensics	Ability to conduct criminal investigation at home and abroad, using ID3 and biometric information	1	"…it enhances investigations..." – R1
		Prevent fraud, forgery and impersonation	Ability to prevent crimes that are linked to stolen or forged identity.	5	"…substantial reduction in the chances of multiple identities of unscrupulous individuals…" – R3 "Reduction in the chances of identity theft…" –R3 "… substantial decrease in anonymity-based crime…"- R3 " …enhance security, reduce corruption and fraud…" -R5

					"…combatting of crimes and other fraudulent activities…" – R9
	Replacement of multiple IDs		Single ID will replace multiple forms of id used.	1	"…replace any other form of identification…" – R3
	Development planning		Database will allow for development planning by government	3	"…enable the government to effectively and efficiently plan and develop the country…"- R3 "Every country needs statistical data on the population for planning purposes." – R7 "…such information will aid in economic planning…" – R9
	Public service delivery		Identification database will improve the provision of services to identified person	3	"… a secure identification system to perform core functions and administer programs and services vital for development …" – R3 "…improve government delivery of services." – R5 "…help to reduce corruption and fraud with regards to the delivery of services...'-R7
Challenges of NIA/NIS					
	Institutional inefficiency	Insufficient, inaccurate, forged and false data	Poor quality of identification database.	5	"… data on individuals captured by respective institutions are inefficient"- R1 "…police CID have the EFAX system […] but it is insufficient..."- R1

					"… information that Ghanaian diaspora abroad are using abroad are different from their real identities…" – R2 "Heavy bottle necks in data verification at various institutions disseminated data centers and different operation and legal framework of acquiring data from these institutions." – R3 "…birth certificates are issued based on the information given by the beneficiary without any means of verification." – R9
		Multiple databases	Multiple databases across institutions	2	"Information data may differ from one agency to another." – R3 "The lack of central database for national identification…" – R9
		delayed authentication		1	"…identities of suspects could be verified from service delivery institutions […] but it takes a considerable time…" – R1
		Inefficiency of NIA		2	"The major challenge had to do with the distribution of the cards" – R6 "…the NIA depends on other telecommunication companies for its network. Accordingly, in the event that there are network fluctuations […] it would affect the rate of enrollment…" – R8
		Absence of addressing system		2	"The NIA has over 2million cards which could not be distributed due to […] difficulties in locating the owners" -R6 "Difficulties in identifying individuals through their addresses…" – R7

	Lack of objective political commitment		Political biases affect the continuation of the scheme	2	"Lack of political commitment due to different interest of political parties." – R4 "Lack of national agenda to ensure continuity. –R4
	Lack of public awareness		Public not fully informed about NIS and functions	1	"Inability to educate the public on the concept and create awareness". -R4
	Lack of funding			1	"…lack of funding also undermines the NIS project." – R7

APPENDIX III

Table 3: Coding Frequency for recommendations

Themes	R1	R2	R3	R4	R5	R6	R7	R8	R9	Total
Measures to sustain NIA										
Financial resources										
- government funding				*		*				2
- revenue from database use	*					*				2
- low cost approach								*		1
Regular update of the database	*									1
Strong legal backing			*							1
Collaboration with other institutions										
- Unified database across institutions			*			*	*			3
- registration at birth	*			*		*	*			4
- vetting and cross-searching			*							1
- decentralized enrolment	*									1
Stringent enforcement laws			*							1
Public education				*						1
Political commitment				*						1
Universality of National identification card							*		*	2

Table 4: Thematic Framework for recommendations

Global theme	Organizing theme	Basic theme	Definition	Frequency	Quotes
Measures to sustain NIA	Financial resources	government funding	Channeling sufficient funds towards NIA and NIS	1	"There should be adequate funding." – R4 "The long-term sustainability of the NIS depends largely on funding"- R6
		revenue from database use	Measures to self-generate funds	1	"… use the database as a source of revenue…for maintaining and updating the database…"- R1 "charges should be instituted for all private organizations that uses the NIA database for verification" – R6
		Low cost option		1	"…populate the national database through a convenient and low-cost mass

					registration exercise like that of the Indian identification system where requirements for enrollment and accessibility have been simplified…" – R8
	Regular update of the database		Activity dedicated to ensuring accuracy of database	1	"The database should be updated periodically…"- R1
	Strong legal backing		Presence of comprehensive laws	1	"The NIA must ensure that the necessary legislations and constitutional amendments are tabled…" – R3
	Collaboration with other institutions	Unified database across institutions	Universal database used across institutions	4	"…could be used by other state institutions to avoid overlapping …"- R1 "…integration of all other identification systems in the country" – R3 "…link all government services to the NIA database…" -R6 "all data from other government institutions should be linked to the NIA database"- R7
		Registration at birth	Registration should occur at birth	4	"…capture the biometric data of new born babies…"- R1 "… national identification numbers should be given from birth..."- R3 "…start the enrollment from birth…" – R6 "Registration and issuance of national identity card at birth..." -R7
		vetting and cross-searching	Multiple existing databases act as checks	1	"…the NIA can cross check biometric data collected during the incoming exercise against other biometric data such as the Voter's register…" – R3
		decentralized enrolment	Other institutions act as enrolment locations	1	"… should be highly decentralized to enable easy access for enrolment." – R1
	Stringent enforcement laws		Enforce laws related to identification and database	1	"…there must be stringent enforcement of laws as well as the emittance of

					punishment to persons who violate any aspect5 of the law on the NIS…" – R3
	Public education		Raising public awareness	1	"Sustained public education." – R4
	Political commitment		Increase in biased political interest in sustaining NIA	1	"Elite consensus on its implementation devoid of political biases…" – R4
	Universality of national identification card			3	"…should be the basic requirement to procure all other documents in Ghana…" – R2 "The national ID card should be the main requirement for the acquisition of any national document such as passport, driving license." – R7 '…the national ID should be the main requirement for the acquisition of any other national document…"- R9