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# Biometric identification technologies and the Ghanaian 'data revolution'*

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ABSTRACT

In the global effort to strengthen national identification systems (SDG 16.9), biometric identification technologies and civil registration systems have been associated with different motives and applications, thus fuelling their competition for public attention and resources. The case of Ghana illustrates how these alternative systems, along with further sources of personal data, have recently been integrated into the larger political vision of a centralised, national population data system. Based on ethnographic fieldwork, the paper traces the difficulties and institutional negotiations that accompany this integration into a centralised population data infrastructure. Acknowledging how sets of actors, infrastructures and power relations are layered onto each other to unintended effects, the article describes the historical process of institutional and infrastructural harmonisation in the production of biometric population registers in Ghana.

***Keywords:*** Ghana, Ghanacard, national identification system, biometrics, data revolution.

## INTRODUCTION

A number of African countries, most prominently Kenya (Breckenridge 2019), have recently embarked on the process of transforming their population data systems with the aim of harnessing the potential of new data types and

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technologies. These so-called 'data revolutions' typically entail the expansion of the volume, accuracy and timeliness of data, and increasingly, the interoperability of new data types (UNDP 2016). Interoperability-based data infrastructures, according to the political vision, make data available for new users and applications. They thus require the reorganisation of institutional boundaries and resource flows (cf. Pelizza 2015).

While data revolutions concern digitisation (von Oertzen 2017) of a wide range of areas of life, in Africa – where civil registration systems are historically weak (Szreter & Breckenridge 2012) – transformations of government data infrastructures first and foremost seek to count and account for people. Lacking official documentation of their legal personhood, ~496 million Africans (World Bank 2018) are excluded from various realms of recognition, especially from basic rights, access to state services, but also private institutions, such as financial and telecommunication service providers. In this light, innovations in biometric identification technologies have been heralded as a potential panacea to the historically rooted problem of incomplete state registration systems (Gelb & Clark 2013).

Ghana, the case study of this article, pursues a three-tier strategy to the digitisation of data, layering the identification of financial transactions (through the digitisation and interoperability of financial services, including card-based and mobile-money transactions) and the identification of property (among others, in the form of an app-based numeric postal address system, a planned GIS-based property registration at the level of local government, and an electronic tax number) onto new modalities of identifying inhabitants of the West African country and its diaspora, through a biometrically authenticated personal identification number (PIN). In his address to the 2017 'African Open Data Conference' in Accra, Ghanaian President Nana Akufo-Addo referenced the integrated population data systems of Kenya and Rwanda when renewing his commitment to the Ghanaian identification agenda and publicly tying the administration's central political vision of a 'Ghana beyond aid' to the production of accurate and timely data. The interoperability of Ghana's scattered population registers through new biometric 'data journeys' (Lemov 2017) had become the central political avenue to harnessing the country's data potential.

The origins of Ghana's national identification agenda date back to the period of the National Redemption Council (1972–1975) (Breckenridge 2010). In 1972, military leader General Ignatius Acheampong introduced the first national identification documents in Ghanaian history (National Redemption Council Decree 129, 1972), mandating the country's electoral commission with the issuing of personal identity documents.[1] Despite this long tradition, to this day the vast majority of Ghanaians do not possess a national ID card. Owusu-Oware *et al.* (2017) analyse how 'both local and international environments reinforce and oppose each other' in the production of the so-called *Ghanacard* project, and account, ultimately, for the project's continued delay. The authors' new institutionalist perspective is problematic, however, as it rests on the assumption of a fixed set of relationships between elite political

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actors who neatly determine the policy with concrete effects on the policy, legal and social ordering of the new information system.

I propose a different angle on the diversification of actors – which here explicitly include material devices, settings and representations besides policymakers, engineers, data curators and statisticians (Latour 2005) – and the ways in which this complicates the current reorganisation of Ghana's national identification system (NIS). Following the call of Thelen *et al.* (2017: 2) for a 'relational anthropology of the state' – or 'stategraphy', I present here the findings of my ethnographic engagement with the 'relational modalities, boundary work and embeddedness of actors' (Thelen *et al.* 2017: 2) of the Ghanaian state 'at work' (Bierschenk & Olivier de Sardan 2014). A number of Africanist scholars have emphasised how material infrastructures and registration practices tie into each other in order to constitute the state in its various facets through the production of 'legibility' (Scott 1998). Donovan (2015) visualises the infrastructural work that underlies identification systems in Kenya's aid sector. Behrends (2018) details the infrastructural arrangements that engender specific experiences of registration and categorisation of refugees at the boundary of the Chadian state. Biecker & Schlichte (2013), for the case of the security sector, explore the everyday practices of Ugandan police, paying particular attention to the performative work of the file. Pointing to the imperfections of state registration systems, these studies remind us of Bierschenk's claim to consider state actors' practices in terms of a pluralism of rules and their constant negotiation (Bierschenk 1999: 333).

Adopting the perspective of 'stategraphy' moreover raises the question 'how specific state constellations and boundaries emerge and are reproduced or dissolved' (Thelen *et al.* 2017: 1) in the context of the state's 'multi-layered, contradictory, translocal ensemble of institutions, practices, and people in a globalized context' (Sharma & Gupta 2006: 6). Various scholars have sought to unravel the forces influencing current productions of measurement policy in the developing world. Cabane & Tantchou (2016) observe how international actors 'infiltrate' governance in Africa by imposing new modes of measurement, including ways of identifying populations for state interventions. Simultaneously, so-called international 'card cartels' (Lyon 2009), that is, conglomerates of a few international technology providers, have been described as effectively controlling the market for identification technologies, thus mediating processes of standardisation and purchasing decisions of elite African decision makers, e.g. during the annual ID4Africa expo. Discussions further centre on how tech businesses benefit from relaxed legal and political regulations on the African continent in developing new applications (see Breckenridge 2018), thereby 'experimentalising' African populations. African governments, finally, have been pictured as subscribing to the logic of 'leapfrogging' when adopting the new technologies, hoping to accelerate economic growth while improving their planning capacity for development. Following the concept of the sociology of expectation, these experts are forced to deliver upon grand promises, which – in the form of abstractions of the future and its possibilities – are deployed to provide structure, mobilise

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resources, and thus justify large investments in technological innovation, but in the face of failed expectations also create a looping effect of ever-increasing promises for the future (Borup *et al.* 2006: 285).

While these perspectives shed useful light on important dynamics in the field of identification technologies, they do not honour the various forms of resistances and adaptations that accompany the circulation of biometrics as a 'travelling technology' (Behrends *et al.* 2014). As Awenengo Dalberto *et al.* (2018) note, identification documents have a social life of their own, relating intimately to practices of citizenship and the production of 'truths', while constantly competing with alternative credentials, such as identification documents issued by non-state organisations. State identification systems become meaningful only in the interplay with the subjectivities they produce (e.g. through their associated classifications) and their appropriation by citizens seeking recognition (cf. Krause & Schramm 2011).

African state practices unfold, in other words, in layered and emerging settings, in which a wide range of actors – explicitly including different kinds of experts (technical, legal, financial), material devices (biometric technologies) and images of the state – interrelate, influence each other and participate in the production of new orders (Behrends *et al.* 2014). This focus on the ways in which ordering practices emerge, stabilise, adapt or break down, emphasises the multiplicities and incoherencies in entangled actor constellations as well as actors' habitual practices which often are not (yet) codified in formal terms. Acknowledging how these diverse sets of actors, infrastructures and relationships are layered onto each other, with often unintended effects, this article traces the historical process of institutional and infrastructural harmonisation in the production of biometric policymaking in Ghana. How do different expectations of using and ways of formatting identification data come to play out against each other in the new Ghanaian vision of an interoperability-based, integrated population data system? Which political assumptions are imbued in the decisions around these state practices and in which ways can the ethnographic engagement with these practices help to reflect the complexity of reorganising state information infrastructures?

## METHODS

Data for this paper were collected in three consecutive fieldwork periods from January to February 2016, July to August 2017 and April to May 2018, in addition to long-term media observation on this topic. The data collected consist primarily of expert interviews conducted in the various government agencies involved in the production of Ghana's National Identification System (NIS). Interviews were carried out with legal, financial and technical experts of the project, staff of the previous registration exercises, activists and civil society organisations, as well as citizens involved in the previous registration exercise (Greater Accra and Central Region).

Due to their location at the very heart of the state, the specific procurement and decision-making processes which constitute national biometric ID systems

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are routinely black-boxed. Moreover, established debates in STS have long argued that the reorganisation of information systems necessarily proceeds incrementally, in the form of overlapping steps of innovation and translation rather than as a global, hierarchical design process (Star & Ruhleder 1996). Innovation in information systems hence always includes infiltrations and adaptations, but also 'reverse salients', such as path dependencies and outright failures (Edwards *et al.* 2007). These structures are only rarely verbalised by the actors involved. In view of this, it is necessary to adopt a historical lens and retrace the archive of previous versions of Ghana's biometric identification system.

The article proceeds in three steps. I begin by delineating past and present frictions in the biometric Ghanacard project. In a second step, I review the political lines of contestation and the fragmentation of institutions, data infrastructures and formats constituting the National Identification System (NIS). Finally, I analyse the current effort of integrating biometric population data with civil registration under the discourse of system harmonisation and the larger vision of a centralised population data system.

## (DATA) FRICTIONS

### *The Ghanacard saga*

Following Breckenridge (2010), Acheampong's first initiative of introducing a national ID card remained limited to Ghana's ethnically overlapping border regions. In 1987, the military rule of the Provisional National Defence Council under Flight Lieutenant Jerry John Rawlings resuscitated the idea with the aim of expanding its reach nationwide. A number of working committees formulated technical proposals which were eventually picked up in the National Economic Dialogue, and in 2001 a call was published for tender proposals to develop a national identity registration infrastructure (Breckenridge 2010: 645). The Ghanaian identity registration project was set in motion with the establishment of the National Identification Authority Secretariat in 2003 and parliament's unanimous passing of the National Identification Authority Act (Act 707) in 2006 (Akrofi-Larbi 2015).

In July 2009, three years after its inception, the National Identification Authority of Ghana (NIA) rolled out the first mass registration exercise for the country's National Identification System (NIS). Despite collecting the biometric data of 15 million Ghanaian citizens, only about 1 million ID cards were eventually distributed in the Greater Accra region, the country's economic and political centre. Systemic errors were attributed, among others, to the failure to collect the contact details of the cardholders. In addition, a large proportion of the registered data was later found irretrievable due to technical problems. This was ascribed largely to the working conditions of the field teams. Questionnaires were filled by local community members, and then transcribed by the NIA field teams along with the recording of biometric data.[2] As Effah (2019) points out, physical storage and transportation of the data posed an

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additional difficulty. Moreover, as a registration officer of the initial mass registration explained, registration proceeded from region to region, necessitating not only the repeated hiring of infrastructure, but importantly also the training of new local supporting staff. With the added challenge of irregular funding, salaries remained unpaid and the registration was prematurely discontinued in 2013.[3]

While a cost of US$40 million had been incurred at this point, applications and standards in the industry had leapfrogged since the inception of the project. This triggered new political visions and ultimately prompted a fundamental review of the system: whereas the first registration exercise relied on four fingerprints, new technological developments in the field, such as instantly issued smartcards with internal data storage, sparked the policymakers' aspirations to enable a wider range of agencies to independently manage the card by storing their own data on it. Although the contractor for the initial registration, French company Safran Morpho (now IDEMIA), proposed to implement the desired upgrades, i.e. smartcards with 10 fingerprints and instant issuance, the NIA rejected the proposal based on the system allegedly being out of date. Instead, in 2012 the agency briefly engaged with the China Integrated Circuit Design Corporation Limited to plan and implement the upgrade. Following a visit to Shanghai, an agreement was reached over a US$115 million loan from the Export-Import Bank of China to cover the expenses for the new system, making all previous investments and registrations redundant.

Around the same time, the World Bank publicised its plans 'to improve the efficiency and coverage of [Ghanaian] government service delivery using information and communication technologies' (World Bank 2013). One component of the World Bank's 'e-Transform Project for Ghana' intended to support the upgrading of the national identification system and online verification services based on international standards 'to help prepare Ghana for a modern e-commerce industry, improve e-government services, and alleviate poverty'. A World Bank loan of US$97 million was granted in 2013, of which US$29.15 million was earmarked for the upgrading exercise and support of the government in the registration and distribution of the new Ghanacards.

The large contrast between the two proposals for upgrading the Ghanacard sparked a major debate in Ghanaian media and civil society. Questions arose over how the NIA could have agreed to go ahead with a Chinese partner at an estimated total cost of about US$300 million when the World Bank's plans suggested a solution to the same problem at a much smaller price tag. Questions were also raised about the integrity of the contract awarding process. This led to the dismissal of the executive secretaries of the NIA in 2013 and again in 2015. As a result of these allegations, the Ghanacard project was temporarily suspended on presidential order, followed by a thorough evaluation which was carried out by UK-based consultants. The NIA eventually decided to continue its work independently from the World Bank in order to pursue its vision for the new Ghanacard – the project evaluation remained the only item the World Bank contributed to the project.[4]

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### *The fragmentation of the project*

As a result of the delay to the national ID system, several Ghanaian government agencies proceeded to set up their own biometric identification systems. Piccolino (2015) and Effah & Debrah (2018) describe in detail the rationales and effects of building a biometric voter register for the purpose of de-duplicating the national voter roll and ultimately enhancing the legitimacy of elections in Ghana.[5] Similarly, the Social Security and National Insurance Trust (SSNIT) responsible for the payment of pensions uses its own biometric chip card to manage entitlements, seeking to reduce duplicate registrations, false claims, and fraud related to biographic data, for example regarding the attainment of pension age. The National Health Insurance Scheme (NHIS), in turn, started the registration of biometric data as early as in 2003. In what were initially district level insurance registers, the NHIS first implemented a magnetic, card-based identification system. When this system failed 'to fulfil its purpose at great cost' due to the card's 3-month production process, with too many 'cards that didn't find the people', an instantly issued, biometric solution sourced from Dutch company Genkey was adopted.[6]

In line with the biometric verification of entitlements in the aforementioned government agencies, biometric identification technologies play an important role in the dispensing of government payments. Dzokoto *et al.* (2016) describe how the world's first biometric banking card, the e-zwich card detailed by Breckenridge (2010), has not gained foothold in Ghanaian economic transactions largely due to socio-psychological reasons. From the perspective of consumers, the technology's alleged non-transparency triggered open distrust and accusations of financial losses, hampering as a result the further penetration of the system's POS devices. Yet, concerted efforts by the Bank of Ghana's Ghana Interbank Payment and Settlement Systems Limited (GHIPSS) have renewed the commitment to introduce the e-zwich payment system nationwide. As a central pillar of the national strategy towards a 'cash-light' economy and the increased interoperability of financial services (Bank of Ghana 2014), a number of public payments, including student loans and welfare payments as part of Ghana's Livelihood Empowerment Against Poverty (LEAP) programme were coupled to the e-zwich system.[7] Further adding to the fragmentation of biometric identification systems in Ghana are the Drivers and Vehicles Licensing Authority (DVLA), which started to issue biometric driver's licences in 2017, and the Passport Office which issues biometric passports in accordance with standardisation processes of regional and international bodies.

### *Growing registration fatigue*

The effect of the fragmentation of Ghana's identification ecosystem was twofold. The multiplication of identification systems first and foremost affected the relationship between citizens and the Ghanaian state. Confronted with repeated registration exercises and contradicting promises of their application,

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Ghanaian citizens remained uncertain what the new national ID would concretely add to their lives. Overwhelmed by the biometric promises of the past, citizens mixed up uses of different registers such as the health insurance and the Ghanacard. One urban trader fully embraced the new Ghanacard in 2016: 'We won't have to walk around with all these cards anymore, our elections will be cleaner, our streets safer …' However, just one year later, she had lost much of her initial enthusiasm. 'They have started this in 2006, but where have we got? I rely on the medical system due to my health. But before I can go to the hospital I have to renew my card, stand in line a whole day whilst I am sick.' Others connect issues of road safety, crime and border control: 'The police have fingerprint readers [to verify driver's licences], alright, but only along the large roads to Cape Coast and Tamale. We need to know who is in our country. But armed robbers know how to evade the police barriers.'

Left in the dark about the application of the new biometric register, and subjected to repeated calls for mass registrations, Ghanaians grew increasingly registration-fatigued. 'You have to come at three in the morning; if you come at five you are already late. They say it is for free but you have to pay, too. Thirty Ghana (Cedis [GHS]), and if you pay another thirty, you jump the line', a client of the NHIS pointed out, refusing on this basis to close her shop to attend the latest NIA registration. Along with growing registration tiredness, belief in the potential of biometric technology to increase government efficiency dwindled, too. When the Internal Revenue Service proposed revising the import procedure and the Ghana Conformity Assessment Programme (G-CAP) to include biometric authentication of the importer, the traders' associations heavily protested out of fear of a prolongation of what they already experienced as a lengthy clearing process.

Public opinion on the new Ghanacard probably hit a low in 2018, when the latest call for a mass registration was announced along with the system's new features. One urban mechanic's attitude had turned into outright opposition. 'Now government is introducing the PIN [personal identification number] and without it you can't even open a bank account. They should take care because after four years they have to answer to us at the ballot.'

As the public and media discussion around the Ghanacard focused on questions around the system's funding and the organisation of renewed mass registrations, the system's specific applications and thus the required data infrastructure (in the form of specific arrangements of hardware, software, personnel and institutions; Edwards *et al.* 2007) remained unclear to the Ghanaian public, leading to misinformation and growing opposition. In light of the absence of a concerted message from the government agencies tasked with the project's implementation and the failure to incentivise registration accordingly, the Ghanaian public gradually lost its initial enthusiasm about the new Ghanacard.

This disengagement of the public from the Ghanacard also characterises the work of non-governmental organisations. With the notable exception of IMANI (2016), the non-governmental organisations which had picked up the issue of

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Ghana's biometric future abstained from fundamental questions of data residency, the technology's double use potential, or the system's anticipated effects on citizenship and inclusion (see also Odartey-Wellington 2014), focusing instead on the technical questions around the policy process and the agenda's funding.

Public opinion about the Ghanacard indicates how state practice is closely tied to images and representations of the state in the past, present and future (Thelen *et al.* 2017). The discursive construction of Ghana's biometric policy agenda continuously depends on erasing the public perception of its past failures and replacing it with a new vision of the biometric future, and notably, the construction of a credible vision of progress and improvement to the quality of life.

## *Competing data infrastructures*

The second effect of the Ghanaian identification agenda's fragmentation manifested itself in the investment in largely incommensurable infrastructures (Ghanaian government sources estimate the total costs of the various ID systems at ~US$400 million). Data infrastructures, like any other form of technological innovation, are not begotten in exclusively rational political and budgetary considerations, but are shaped by desires and expectations. While expectation has been described as coordinating in its function (Borup *et al.* 2006: 285f), the case of Ghana's biometric policy agenda illustrates how expectation itself may also become fragmented along different sets of actors, each mobilising competing visions of the future and ways of manipulating the present.

Policymakers in Ghana commonly point to the origin of the country's electronic identification agenda in the fight against *Sakawa*, the local network of internet scammers, in the late 1990s.[8] Wary of the adverse effect of these activities on trust in the Ghanaian economy, and in emerging online businesses in particular, the Ghanaian government began laying the foundations for the current electronic communications infrastructure, thus carrying the early political visions of a national ID system that could secure Ghana's borderlands into the digital era.

In 1998, the National Communications Policy Conference (COMPOL 98) defined the country's first foundational ICT policy – the Ghana Information and Communication Technology for Accelerated Development (ICT4AD) – which was passed into law after the change of government in 2001.[9] In 2008, emanating from standards defined by the International Telecommunication Union, in addition to standardisation processes triggered by the Commonwealth Technology Organisation, the African Telecommunications Union, as well as ECOWAS, the policy eventually got its teeth with the passing of the Electronic Communications Act (Act 775) and the establishment of the executives for the country's ICT-based vision to 'transform into a knowledge-based economy': the

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National Communications Authority, the National Information Technology Agency (NITA), and in 2012, the Data Protection Commission.

The diversification of Ghana's political institutions in the field of ICT further anchored the idea of ICT4Development in the Ghanaian development vision. When the World Bank introduced its programme logic of e-transformation in the early 2010s, various government agencies in the playing field adopted their own ICT focus to enable digital government services, among others in internal revenue and justice, but also to increase efficiency in areas such as procurement and legislation. The idea to allow Ghanaian citizens to engage with their government through digital interfaces, and also to assist government agencies, such as the Registrar General or the Revenue Authority, with managing transactions online, required the component of identification at a distance (e-identification). This, according to the political vision, would improve the efficiency of service delivery and counter abuses of Ghana's emerging welfare institutions by deduplication and detection of ghost registrations.

Despite this common rationale, the fragmentation of Ghana's ID ecosystem meant that different agencies developed their own stances on the idea of identifying people following the specificities of their applications and standardisation processes in their varying institutional contexts (such as, the international recognition of travel documents). This became most obvious in mutually incompatible choices for data formats, procedures and institutional cooperation.

Agencies came to differ in their ways of establishing evidence of a person's official identity, but also in their models of formatting identities, updating registers, and even funding the different identification projects. Hoping to regain their initial investments through the sale of authentication services, the registers created substantial competition for funding. The Electoral Commission, for example, has been confronted with criticisms regarding its data formats. Since its inception in the National Redemption Council era, the history of the Ghanacard has been closely entangled with the Electoral Commission and continues to build on its technical expertise and logistical assistance, all the while maintaining a significant mobility of staff between the two institutions.[10] Yet, in the absence of central coordination, the two institutions chose different formats for identifying individuals. As the voter register records citizens' age at the moment of registration, rather than the date of birth, it does not allow matching against a population register built on complete birth dates. On the voter ID and other documents, names appear in differing spellings and orders, and even with names that do not match registrations in the other identification systems at all (for example, choosing local over 'Christian names'). The voter card, the EC argues, is merely an administrative aid for easing the process of biometric verification against the biometric voter roll. This perspective is undermined, however, by widespread practice of using the voter ID as an everyday proof of identity, e.g. in bank transactions.

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Ghanaian government institutions are further divided on the question of what counts as acceptable evidence for establishing the identity of a person. In an interaction observed in a government agency in Accra, a government official rejected the EC document as a proof of identification, noting that 'I don't believe in the voter's card. Have you been to register? Do you know the type of documents they accept [to prove your identity]?' In this particular encounter, a membership card of a professional association trumped the EC document's credibility.

Confronted with the issue of doubt-free authentication of applicants' identity, especially in the context of regional and international standardisation, the Passport Office of Ghana's Foreign Ministry decided to base the application procedure for passports exclusively on the birth certificate. However, as the Ghanaian context is marked by low birth registration rates at around 63% (GSS 2015) and high incidences of late registrations (in many cases, registration in adulthood, e.g. in the process of the passport application) this approach is unfeasible for the wide range of agencies registering people for basic service provision.

Similarly, questions around data residence and retrieval present challenges to the Ghanaian population data system. Aimed at linking identities to physical addresses, the Ghanaian government's 'Jack, where are you?' initiative reasoned that one of the factors standing in the way of development in Ghana is the absence of a reliable address system. Following a street naming exercise in 2015/2016, both the Ghana Post and the Ministry of Local Government and Rural Development (MLGRD) proceeded to launch competing digital address systems. The Ghana Post's AsaaseGPS app, programmed by Ghanaian company Vokacom assigns a digital address to every 5-metre square in the country. Through a mobile based app, citizens have the possibility to self-register with the Ghana Post by sending photographic evidence along with their GPS coordinates. Local postal agents then verify the data. Linking with the biometric identification system, according to the programme managers at the GhanaPost, further adds evidence to this process.[11] The MLGRD, in contrast, seeks to advance decentralisation when it suggests registering addresses in the country's GIS-based property registration, for the 'transfer of knowledge and skills into the communities', and the location of the data where they are needed for planning, thus limiting the national government to the role of oversight and monitoring.

Incompatibilities further persist regarding the assurance of data quality. While relatively affordable biometric registration kits promote one-off mass registration throughout the country, they do not allow for keeping these registers up to date. Whereas institutions like the GhanaPost assure data quality through local postal agents, the NHIS mobilises users themselves to keep their data up to date through accessible online and mobile registration services (e.g. NHIS mobile renewal service), while SSNIT offers access to personal data via their ATM-like terminals at various head offices.

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Finally, Ghanaian government agencies have developed separate approaches to the question of funding and revenue generation. The biometric NHIS card, for example, which also keeps a minimal medical record, not only promised the reduction of false claims, allowing better financial planning and resource use based on exact membership statistics and enhanced data credibility. As one of the first widely used biometric registers in the country, including ~11 million individuals, the system is further designed with a revenue-generating character in the form of authentication services for secondary users such as banks or telecommunication providers – a model later translated into the Ghanacard's political agenda.[12]

Government agencies disagree about what constitutes sufficient proof of a physical address and a person's registration in it, but also on the fundamental question of data ownership and residency, which are not least tied to important ethical concerns when (foreign) companies are involved in the identification system.[13] This section presented the competing visions of biometric applications in Ghana's fragmented population data system. The examples discussed here illustrate how the disintegration of the Ghanaian population data infrastructure manifests itself along lines of contestation about the very format of available data and its envisioned applications. The following section presents the current effort of integrating these different formulations under the discourse of system harmonisation and data interoperability.

## IN SEARCH OF HARMONISATION

Despite the fragmentation of institutions and data infrastructures, Ghana's identification agenda revolves around a shared notion of modernity. Following Borup *et al.* (2006), 'hyperbolic' visions of the future are fundamental to the constitution of industrial modernity, in which collective expectations of technological innovation have come to render its legitimation nearly obsolete (Borup *et al.* 2006: 289). Accordingly, the head of, at the time, one of the few civil society organisations endorsing the topic of biometric identification in Ghana proclaimed on this matter: 'Besides God, I only believe in technology'.

By 2016, manifesting the NIA's new vision for the Ghanaian identification system, the Ghanacard project had been significantly expanded. Along with technological innovations in the field of identification, specifically regarding iris recognition, instant card production and improved smart cards, policymakers developed new applications for the revised system, aimed at integrating all person-based data under a single, centralised national identity registration architecture. 'We need a central biometric system, because scattered systems are easy to abuse. We are looking at it from a holistic national view. The same personal identification number will be used in all our registers. Being able to cross-reference will be the system's biggest value.'[14] Cross-referencing, and hence engendering new 'data journeys' (Lemov 2017) based on biometric matching of register entries, the NIA believed, would thereby enable the analysis of previously not data-captured realms of life. As a key expert of Ghana's

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prominent civil society organisation IMANI warned in 2016, biometric identification had the potential to create entirely new social and by extension also bureaucratic classifications. Matching a national population register with, for example, digital addressing data or tax IDs could be used to create new categories of taxpayers, e.g. on the municipal level, and hence fundamentally impact the social distribution of wealth and resources.

This final section of the article examines how Ghanaian government agencies negotiated the integration of their largely incommensurable data infrastructures into the vision of a harmonised population data infrastructure built on the biometric matching of identification data across various registers.

### *Inter-agency cooperation*

The vision of a Ghanaian data revolution, in which different types of data become available to new actors and for new purposes (Pelizza 2015), mobilised renewed support and momentum in the Ghanacard agenda following the repeated delays of the project.

In January 2016, realising that redundant investments of over US$400 million had been made by the various government institutions each building their respective biometric identity registers, President John Mahama ordered a halt in all further investments in biometric technologies and registration exercises, to rely instead on the centralised biometric population register of the NIA. Following the presidential order to discontinue fragmented spending on biometric identification systems, the terms of the debate around the Ghanacard project shifted dramatically. A need for harmonising the partially competing, and largely incommensurable systems was acknowledged across the various agencies involved in the project and became the dominant trope for the project and its way ahead. With the December 2016 national elections, and the central campaign promise of the winning New Patriotic Party's flagbearer and current President of the Republic of Ghana Nana Akufo-Addo to implement the project in the administration's first year in office, the Ghanacard project was again elevated to a national priority, giving the harmonisation process renewed momentum.

The technological dimension of harmonisation was perceived as straightforward: the executive arm of government responsible for regulating investments in ICT, NITA, is mandated by law to ensure interoperability between all government data by defining compliance protocols[15] and closely monitoring adherence to international standards (i.e. ISO certified data management and security requirements) 'so others can feed from their data'.[16]

The political harmonisation process proved more complicated, however. 'We look at our environment, our culture and the attitude of the people. Our national ID is used for services, like banks, social services, education, now these institutions have already gone ahead. Now you have to discontinue those otherwise the national ID will become an empty ID card. We need to agree with them on terms and conditions for service provision so they can

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plan when they can discontinue. It is not deployment from scratch. Harmonisation comes at a cost.'[17]

For this reason, following the change of government in December 2016, the Ghanacard project was put under the direct supervision of the Vice President to allow for better coordination of the policy process. In addition, the National Development Planning Commission was tasked with overseeing a series of quarterly inter-agency committee meetings on the legal, financial and technical issues of the new identification agenda.

Over the course of 2017 and 2018, NIA, NITA, the Department of Births and Deaths Registration (BDR), National Population Council, Ghana Statistical Service and Justice Department came together to 'brief each other on activities and plan the way forward' toward the grand vision of integrating Ghana's dispersed population data under one centralised and interoperable information architecture.[18] With the initial deadline to introduce the Ghanacard nationwide on 15 September 2017,[19] these inter-agency committee meetings were criticised for their scheduling. But, considering what one high-ranking civil servant in this constellation pointed out, the meetings represented a major accomplishment. 'Usually, in this country, it is difficult to work together. 'You are in my turf' is all you will get.' The meetings produced a substantial breakthrough when the committees came to an agreement to couple biometric identification to a strengthened birth registration system.[20]

## *In support of birth registration*

Confronted with the expectation of an interoperability-based population data system and the reality of the incomplete and largely incompatible registers of different user agencies, the inter-agency committee meetings faced the challenge of conceiving a way of reorganising boundaries of their institutional information flows in order to allow the harmonisation of processes and data infrastructures. Realising the closures and frictions in the circulation of biometric data between their organisations, the agencies involved in the various inter-agency committees reached a consensus on the adaptation of the registration model tried and tested earlier by one of their key stakeholders, the Passport Office. Arguing that the lack of political commitment for one basic register for the national identification system had been a root cause for its repeated delays, the committee decided to emulate the experience of the Passport Office into the system for the Ghanacard, envisioning that 'with the new system, we will be able to verify against BDR and instantly issue the ID cards'.[21] The National Identification Amendment Law (Act 950), passed in November 2017 provided the legal basis for the decision to register Ghanaians in the National Identification System (NIS) solely on the basis of the birth certificate, or alternatively its derivate, the passport. In addition, a large number of Commissioners of Oaths were trained in the process to accommodate for persons lacking both documents. Whereas earlier registrations for the Ghanacard targeted the population aged 16 years and above, the new

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National Identification System links to the personal identification numbers assigned at birth and registers biometric data from age 6. Different from adults, who receive dual-interface, chip-embedded smart cards enabling electronic and physical transactions, children aged 6–15 are issued 2D barcode cards. All children's data are also electronically linked to the cards of their parents.[22]

The decision to strengthen civil registration along with biometric identification was lobbied for intensively by BDR, NPC and GSS, and followed multiple rationales. Not only does birth registration critically sanction legal personhood of Ghanaians from an early age and thereby, crucially for the Ghanacard and National Identification System, provides formalised evidence (in the form of the documentation of descent) establishing the link between identity and citizenship. Moreover, linking the national ID system to the process of birth registration retroactively also strengthens Ghana's civil registration and vital statistics system (CRVS), addressing on the one hand, the problem of late registrations (in adulthood),[23] and on the other, providing invaluable demographic insights.[24] In the remaining part of this article, I will focus on a third rationale for the decision to integrate CRVS and biometrics, that is, the mobilisation of biometric 'data doubles' (Bouk 2017) for the political vision of an encompassing Ghanaian 'data revolution'.

### *Interoperability-based data infrastructures*

When Ghanaian President Akufo-Addo in his speech at the African Open Data Conference expressed the commitment of his administration to integrate the population data architecture, he crucially linked this vision to the improvement of development planning and the high-level political commitment to global development reporting, emphasised not least by Ghana's international role in SDG advocacy.[25]

In their 2017 assessment of Ghana's data ecosystem, the National Development Planning Commission of Ghana (NDPC) proposed to integrate a wide range of person-based data into the civil registration system, including, but not limited to, administrative data from various government agencies (i.e. health, education, internal revenue), telecommunication providers' call detail records, satellite imagery, financial transaction data and data from social media. This marked a major paradigm shift in the Ghanaian population data system. According to a high-level government statistician, 'we have always been told that our registers are not up to the international standard, but now we understand that what we have we can put to a use'.[26] According to the NDPC, the main rationale behind integrating various sources of person-based data is to reduce costs in addition to producing more timely, that is, in this case quarterly evaluations of Ghana's development progress. Based on the well-established administrative systems of the Ghanaian health sector's cloud-based District Health Information Management System, explorative studies are testing the potential of biometric links between the civil register and

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administrative health records (Serwaa-Bonsu *et al.* 2010; Odei-Lartey *et al.* 2016). These initiatives further underscore the direction of the Ghanaian data revolution with its vision of 'real-time' evaluations of extensive population data, 'ideally, in the form of a dashboard indicating in real time how we are doing in specific sectors'.[27]

In the pursuit of rendering government statistics less dependent on allegedly unreliable projections and proxies (Jerven 2013) of intermittent census cycles, the integration of diverse sources of administrative data through unique personal identifiers was further presented as providing insights into areas of social life that previously were not reflected in official statistics, and allowing longitudinal analyses across institutions and life-transitions. Supported by Statistics Denmark's 'Partnership for Administrative Data' (Statistics Denmark 2017), current policy discussions on Ghana's reform of the population data system include the travelling model of the Scandinavian civil registration system in which, based on a coherent and life-long PIN, different agencies make their registers available for other users and applications. For Ghana, this requires that personal data can be matched across registers. 'Registration of the population will rely on people providing links to existing databases. We know the data will not match. So the link will be biometric *and* the PIN.'[28]

In other words, two digital data doubles will be used to achieve interoperability between Ghana's population registers. The decision to strengthen both biometric identification and CRVS manifests not only the effort of inter-agency harmonisation, but crucially points to the new applications that have become associated with the Ghanaian population data system since the Ghanacard project's latest upgrade.

Transposing solutions from the Danish population data system into Ghana recasts the question of incentivising registration. Whereas the Danish integration and relatively free circulation of population data between agencies enables a substantial welfare system, the same cannot be said of Ghana. Public debate in the West African country has not yet picked up on the notion of the sensitivity and double-use potential of personal data and hence, whether potential risks are balanced with concrete benefits.

## *The way ahead*

The decision to provide administrative linkages with other government agencies in the registration exercise was not received without setbacks. Registration for the new Ghanacard captures standard biographic data, in addition to biometric data including 10 fingerprints and iris scans. Combining different types of biometrics, according to the NIA planners, is a necessity in a context where large parts of the population engage in manual labour which may cause false results in automated fingerprint recognition. At the same time, upgrading the National Identification System to include iris scans created a difficulty because licensing agreements with German contractor Dermalog initially did not include this feature. Moreover, Ghanaian information scientists disagreed

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about the new application of Ghana's population data system. One prominent internet activist rejects the widespread assumption that Ghana does not have sufficient data. In this person's opinion, instead of investing in a renewed registration exercise for the National Identification System, the government should rather invest in the relationship between the existing population registers. Yet others re-articulate the question of data compatibility when commenting polemically that 'houses do not have fingerprints'. Similarly, one ministerial staff member noted on the policy process that 'we are making the same mistakes over and over again. … We should just learn by tackling one standard at a time, snowball from there.' This staff member's opinion was that questions of future-proofing, data security and principles of data sharing are too complex to be addressed upfront, or by a single regulatory authority.

In 2018, with efforts of a renewed mass registration at a new height, politicians in the opposition party NDC contested the process of binding the Ghanacard registration to links with other registers, leading to pending court cases on the issue of which documents may be required for registration. In particular, civil society actors claimed that the new modality of obtaining the Ghanacard carries the risk of exclusion and de-nationalisation. Others, including the former President, John Mahama, and the previous head of the NIA, Osei Kwame Griffith, publicly criticised the huge increase of the Ghanacard's costs since its inception.

Although these actions contributed to the renewed delay of the mass registration scheduled initially for 28 May 2018, political commitment for the Ghanacard has translated into GHS200 million earmarked for the project in the 2018 national budget and an agreed cost of US$1.22 billion over the course of 15 years. Additionally, executive staff of the NIA are aware of the pressure and prepared to live up to the political expectations. 'This time around, we have a lot of stakeholders, which makes the process very difficult but we have learned from the previous registration exercise. This time, we start and test. We start in Accra, but even there we need to test it first.'[29] Accompanied by an intensive public outreach programme including the online dissemination of informational videos, the mass registration set off in Accra in May 2018, first targeting service personnel of the Ghana Police and Armed Forces, along with some ministerial staff. Deliberately targeting citizens who by default possess birth certificates due to their professional status, operate in efficiently structured organisational settings and can hence easily be mobilised for the registration exercise (through so-called 'Part I' orders; Agyekum 2019), to some extent levelled the technical challenges encountered in the initial phase of the Ghanacard's latest roll-out strategy. Although reports about the latest mass registration are fraught with criticism about the slow pace of the exercise, the breakdown of infrastructure,[30] as well as renewed irregularities – notably registration incidents after the official closing times of the registration centres and police investigations into the registration of non-citizens – the strategy of the NIA to roll out gradually and based on the experiences of the pilot appears to work. Media reported that by October

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2018, ~90,000 personnel of the security services and civil sector had been registered. After opening to the general public in November 2018, by April 2019 the mass registration exercise had covered 498,021 people in Greater Accra's Adentan-Madina, La-Nkwantanang and Ga East districts and had issued a total of 450,937 cards.

At the same time, the notion of learning and adaptation has become ubiquitous in the Ghanacard's policy circles. Inter-agency cooperation in the production of the Ghanacard has not remained limited to the mutual agreement and united lobbying effort for the integration of biometric and civil registration systems, but also includes substantial technical and logistical collaboration. Due to their close historical connection, the Electoral Commission and NIA have seen an intensive exchange of staff. The experience of the Passport Office being emulated within the National Identification System provides another example of mutual learning. But also in very tangible terms, such as provision of materials, logistical support and method training (e.g. from the Ghana Statistical Services), the experience of inter-agency involvement in the Ghanacard has contributed to the revival of the project's promise of a biometric future.

## CONCLUSION

Drawing on ethnographic material, this article analyses efforts at introducing a biometric identification system in Ghana. Following various actors (including material infrastructures and immaterial concepts, such as travelling models and expectations) as well as their integration in emerging settings and constellations, the article traced how these necessarily messy elements interact in the production of a new modality of ordering social and political life. This pluralistic approach highlights the complexities and difficulties of harmonising and reintegrating fragmented population data systems while foregrounding the motivations and political visions imbued in the reorganisation of government information infrastructures in Africa.

Despite repeated setbacks, decision makers in Ghana do not indicate any signs of the 'crisis of faith' that has strained quantification as an ordering idea in many other parts of the world (Mennicken & Espeland 2019). Visions of bright biometric futures continue to feed into political decisions and their communication to the general public. The material presented here shows how these representations of the future are necessary elements in the mobilisation of support for renewed mass registrations and increased government spending on Ghana's biometric agenda. The Ghanaian government's recent focus on interoperability seeks to technically and politically materialise the integration of fragmented ID systems in a centralised data infrastructure. At the same time, integrating previously incommensurable data sources and formats into a grand vision of a centralised population data system aims to improve development planning and reporting, and ultimately the lives of all

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Ghanaians – therefore justifying in the eyes of experts the renewed, extensive government spending on the national ID system.

At the same time, although Ghana has advanced the harmonisation of data formats, infrastructures, uses and applications through inter-agency cooperation and the translation of ideas between them, various reverse factors, such as contractual agreements with contractors of the earlier registration exercises, continue to impact on the policy process, and hence further complicate an estimation of the potential impact and the unintended consequences of technological innovation.

Biometric technologies, beyond introducing an entirely new form of evidence into the Ghanaian population data system, allow for new data journeys and the association of previously unconnected bodies of knowledge. Despite growing opposition from citizens and civil society organisations, the Ghanaian population still seems to abstain from debates about the uses and risks of their personal data. With the notable exception of IMANI's intervention into the question of which classifications of taxpayers are going to emerge from the new identification system, civil society remains silent on the potential impact of the processing of identification on issues of redistributive justice, privacy and citizenship – particularly so in a time of intensifying contestations around citizenship and strong indications of rising xenophobia in Ghana.

## NOTES

1. Interview Electoral Commission of Ghana, Accra, April 2018.
2. Interview, former registration staff, Accra, February 2016.
3. Interview, former registration staff, Accra, February 2016.
4. Interview, WB e-transform coordinator, Accra, 2017.
5. The contestation of the biometric voter register in the months preceding the 2016 presidential elections, and the recent attacks on Ghana's Electoral Commission (EC), underscore the point raised by Debos (2016, for the case of Chad) that technology does not present a straightforward fix to societal sources of conflict.
6. Interview, National Health Insurance Scheme, Accra, February 2016. Genkey also provides the card-based solution for the Electoral Commission's voter roll.
7. Interview, GHIPSS, Accra, July 2017.
8. Interview, Data Protection Commission, July 2017.
9. In 2003, under the new government of John Agyeman Kufuor (NPP), the framework was developed further into the 'Integrated ICT-led Socio-economic Development Policy' which specifically defined strategies to, among others, 'promote the deployment and exploitation of information, knowledge and technology within the economy and society as key drivers for socio-economic development', and 'modernize the civil and public service with the aim to improve its administrative efficiency, effectiveness and service delivery through the implementation of electronic governance and government initiatives' (Government of Ghana 2003). In 2004, the Ghana Investment Fund for Electronic Communications (GIFEC) was launched to provide the infrastructural basis for these plans.
10. Interview Electoral Commission of Ghana, Accra, April 2018. Similar inter-organisational learning occurred between the NIA and Ghana Statistical Service, for example on the issue of reaching remote areas for registration exercises.
11. This proposal was contested in court, however, in connection with political opposition to the latest effort of carrying out the mass registration for the new Ghanacard.
12. Ghanaian data protection law requires the informed consent of users if agencies intend to share personal data with third parties. While the Data Protection Commission vets the infrastructure and

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institutional processes behind these transactions, it remains sceptical about the level of education in the general population and hence its ability to consent.

13. Besides the involvement of Dutch company Genkey and French IDEMIA in the sectorial ID systems, Danish-Ghanaian Identity Management Systems (IMS) has contracted for the card production of the latest version of the biometric Ghanacard.

14. Interview, National Identification Authority of Ghana, Accra, February 2016.

15. For the case of the NIS, NITA oversees and advises the NIA on system requirements, but also the design of workflows, business and functional engineering.

16. Interview, NITA, Accra, August 2017.

17. Interview, NITA, Accra, August 2017.

18. Interview, Ghana Statistical Service, Accra, July 2017.

19. On that day, the President of Ghana Akufo-Addo ceremonially received the first Ghanacard. A later deadline for April 2018 has also not been honoured. In 2019 the mass registration still remains in the planning phase.

20. Interview, National Population Council, Tema, May 2018.

21. Interview, National Identification Authority of Ghana, Accra, August 2017.

22. Interview, National Identification Authority of Ghana, Accra, August 2017.

23. According to BDR, low birth registration rates in Ghana are a result of colonial discrimination in civil registration practices, and the post-colonial struggle to stay at par with the population growth in the establishment of registration centres: in 2016, there were 412 service delivery points nationwide (38 in 1965), of which 323 were located in urban areas.

24. The procedure for birth registration includes filling in a questionnaire covering issues such as fertility rates, maternal and infant health, but also sociological factors such as ethnicity, religion, education and profession of the parents.

25. For example, the UN appointment of the President of Ghana as the co-Chair of the Group of Eminent Advocates for the UN SDGs.

26. Interview, Ghana Statistical Service, Accra, April 2018.

27. Interview, National Development Planning Commission, Accra, May 2018.

28. Interview, National Identification Authority of Ghana, Accra, August 2017. My emphasis.

29. Interview, NIA, April 2018.

30. In May 2019, media reported that the online pre-registration system, of which most were unaware until this point, had crashed following the announcement of the Executive Secretary of the NIA that those preregistering online would skip queues at the registration centres.

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