

Identity-management and citizen scoring in Ghana, Rwanda, Tunisia, Uganda, Zimbabwe and China

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Summary

- Most countries in the sample, led by **Rwanda**, are on their way towards a centralized, unified and biometric repository of their population.
- Based on these reliable, unique identifiers, scoring services are beginning to appear, chiefly credit reference bureaus, but remain rare. There is no example of a comprehensive social score in the sample.
- Data protection laws exist in most countries except for **Zimbabwe**, which has, in recent years, become a testing ground for **China's** identification technologies.
- Hardware and software is almost universally bought outside of the continent, creating unique challenges for all countries in the sample.
- SDG 16 ("peaceful and inclusive societies") is oft-quoted as a justification for investment in identity management but there is little to no evidence that actions of the industry further that goal.
- There are outliers. Some MPs and civil society activists successfully opposed the centralization of biometric data in **Tunisia**.

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Introduction

Although academic research on the topic is only emerging, citizen scoring can be said to involve “categorizing and segmenting, and sometimes rating and ranking, populations according to a variety of datasets, with the goal of allocating services accordingly and identifying specific ‘risks’ and behaviours” (Dencik et al., 2018).

This activity, in turn, can only take place if a pre-existing database of the population is available from which to reconcile, or match, the “variety of datasets.” Creating and maintaining such databases is the mission of the so-called identity management industry. This industry made great strides on the African continent since the mid-2000’s, mostly due to the requirement for biometric passports introduced by the United States in 2002. The development of the financial industry, especially mobile transactions, also contributed to the need for a modern management of personal data (GIZ, 2018).

This report examines the status of social scoring and identity management in Ghana, Rwanda, Tunisia, Uganda and Zimbabwe, as well as an excursus about China’s social management systems.

Before delving into the specificities of each country, it is worth noting that some larger trends affect identity management and social scoring in the African context as a whole.

/ THE COLONIAL HERITAGE

With the exception of Zimbabwe, which exists in its current form since 1987, the countries in our sample were granted independence over sixty years ago, between 1956 (Tunisia) and 1962 (Uganda). The administrative organization, however, changed little from the colonial period, especially at its smallest levels (on this topic, see for example Alou, 2009, for Niger ; Mback, 2000, for Cameroon and Forquilha and Lacharte, 2010, for Mozambique).

The colonial administration, in a context of low literacy and low legitimacy, pursued its aim of controlling the local population by entrusting the responsibility of very small territorial units, down to a few hundreds adults, to a local chieftain or elder. This design was applied in the countryside at the village level but also - what the colonial powers themselves never implemented at home - in cities, often at the block level.

As we will see in the case of Rwanda, this organization has profound consequences today.

/ **AMBITIOUS IF INCOMPLETE IDENTIFICATION PLANS**

The goal of modern identity management lies in creating a single database containing all personal information the administration has collected on all individuals in a given country and in which each individual is assigned a unique, immutable identification number. This can be done either by creating the database from scratch or by merging and deduplicating existing databases (ID4Africa, 2018).

As we will see, some countries are already close to achieving this goal. However, it is worth noting that most African countries agree that this goal is worth pursuing, a conviction which most countries of the European Union, for instance, do not share (some in France, in particular, were so outraged in 1974 that its government would create an electronic record of the population that they created what became the foundation of digital privacy legislation ; Weill, 1990). Most countries in the sample, for instance, created National Identification Authorities for the sole purpose of collecting biometric information on their population, a type of institution that does not exist in any country of the EU.

Several African countries already link their identity databases to applications that go much beyond anything seen in the EU. Côte d'Ivoire, for instance, started associating each SIM card to an identity card number in 2012 and renewed the process in 2017, this time with biometric data (Abidjan.netTV, 2012 ; Kautcha, 2018).

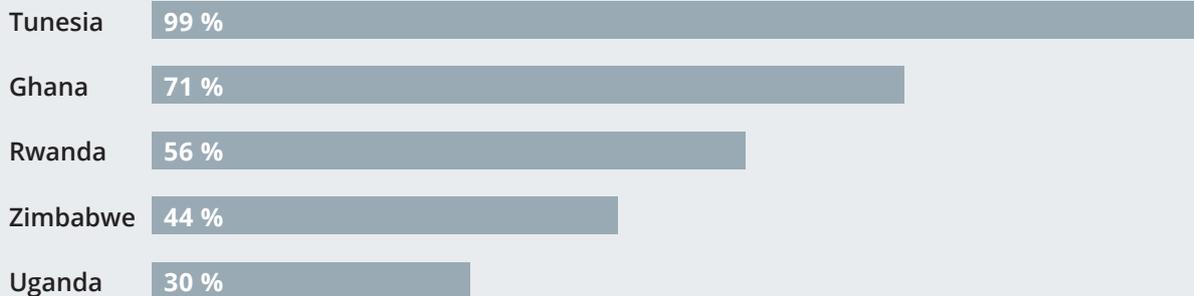
A major impetus for the blanket identification of the population is the formalization of the economy. In countries where most of the trade happens informally, the fiscal possibilities opened by constant identification are enormous. To put it simply, if the administration could know who sells what at what price - and charge VAT on the transaction - the tax base would increase manyfold.

Despite this general enthusiasm and lack of hurdles, the registration of the population is, on average, largely incomplete. A survey among the attendees of ID4Africa, the annual conference-cum-fair of the identity management industry on the continent, showed that they believed that only one in five inhabitants of their countries was registered in a national database (ID4Africa, 2018:17).

Data from UNICEF (see chart) shows that less than one in two children are registered within five years of their birth in Zimbabwe and Uganda, with only Tunisia achieving full registration.

Incomplete registration

Percentage of children under age 5 whose births are registered.



Source: UNICEF

/ QUASI ABSENCE OF DATA PROTECTION

Data protection legislation exists in some countries but remains incomplete. A 2017 World Bank report on 17 African countries concluded that “a majority of countries lack adequate legal frameworks to support and regulate modern identity management systems” (World Bank, 2017:12).

It is unclear if the issue of data protection has any political appeal on the continent. The first Data Protection Africa Summit was held in November 2018 in Mauritius. There, none of the 32 speakers were from homegrown civil society organizations or journalists (Data Protection Africa Summit, 2018). Instead, the conference featured representatives of the GAFAM, government authorities and local vendors. The website of the organizer, Ghana-based Africa Digital Rights Hub, was down at the time of writing.

/ AN ALMOST COMPLETE RELIANCE ON INTERNATIONAL CONTRACTORS

The third continent-wide trait of the identity management industry in Africa lies in the quasi absence of local contractors.

ID4Africa, the annual trade fair started in 2005, is itself based in Hong-Kong. At the last conference, which took place in Abuja in April 2018, the vast majority of sponsors and exhibitors were from North America, Europe or Asia (see map below), although there are exceptions.

This quasi-absence of locally-produced hardware and software is often, as we will see, a cause for friction.

Worldwide attraction

Office addresses of exhibitors at IDforAfrica 2018 (Abuja) as listed in the event documentation.



Source: ID4Africa

/ OVERVIEW OF THE FIVE AFRICAN COUNTRIES

| | Population | National authority | Number of biometric databases | Data protection act | Citizen scores |
|-----------------|------------|---|-------------------------------|--|--------------------------------------|
| Ghana | 30m | National Identification Authority (2006) | 6 | Data Protection Act (2012) | Credit reference bureaus (CRB, 2007) |
| Rwanda | 13m | National Identification Agency (2007) | 2 | - | CRB (2010) Ubudehe (2001) |
| Tunisia | 12m | - | - | Loi sur la protection des données à caractère personnel (2004) | - |
| Uganda | 46m | National Identification and Registration Authority (2015) | several | Data Protection and Privacy Act (2019) | CRB (2008) |
| Zimbabwe | 17m | Registrar General ¹ | At least 5 ² | - | CRB (2016) |

/ A NOTE ON SOURCES

The report used peer-reviewed sources where available (mostly to research the case of China). In other cases, it used reports by reputable institutions, such as corporations or news outlets. Some personal points of view were used as well, such as blog posts, and are indicated as such in the report. Personal testimonies, collected on social networks or via e-mail, were used to shed light on specific issues. In most cases, the names of the people involved were withheld for privacy and security reasons.

¹ The Registrar General is a colonial-era institution which manages registration (such as passport issuances) rather than identity.

² Passports database, border crossing database shared with South Africa, BVR, facial recognition database, biometric business register.

Ghana



/ ATTEMPTING TO CENTRALLY MANAGE IDENTITY

As in other countries, biometric passports acted as a catalyst towards a centralized identity management system in the late 2000s (Dankwa, 2010). The National Identification Authority was created in 2006, a new legal framework, under the National Identity Register Act, was voted in 2008, the details of which were laid out in the National Identity Register Regulations of 2012.

By the mid-2010s, however, it was unclear if the new strategy was a success. Civil society experts, which have little to fear from the government (Ghana is ranked as “free” by Freedom House), talked of an “identity management crisis” (Ortsin, 2014 ; Boateng, 2013). Indeed, from the government’s own admission, no less than six biometric databases coexisted in the country in 2017: the national ID (Ghana Card), the national health insurance scheme, the passports database, the driver’s license system, the immigration system and voters rolls (Boateng, 2017).

Not only does the centralization of these databases (the stated goal of the reforms of the 2000’s) seem far remote, they appear to operate in silos and not to be shared between institutions. The National Pensions Regulator, for instance, still required in 2017 people to provide thumb fingerprints for identity management (Abu Omar, 2018), an antiquated form of biometric data collection.

/ LOANS, TENDERS AND DISSATISFACTION

The history of identity management in Ghana is - as in other African countries - scattered with international deals that raised suspicions of corruption. In the early 2000’s, for instance, as the Ghana Card was being created, the French president appears to have offered a \$30m grant to Ghana (Ansah-Addo, 2011) under the condition that the tender for the Ghana Card be rigged in favor of French company Sagem, now Safran-Morpho (the American ambassador in Accra at the time sent a letter demanding clarifications to the Ghanaian government, as American firm Hewlett-Packard was a contender in the bid ; see Bridgewater, 2005).

A similar story was repeated in 2014, as the National Identification Authority secured a \$115m loan from the China Export-Import Bank during a visit in Shanghai, which was then used to secure a contract of similar value with China’s Integrated Circuit Design Corporation to produce new Ghana Cards, bypassing normal procedures for public tenders. Local experts stated that Ghanaian firms could have provided a similar service at one tenth of the cost (“NIA blind-side...”, 2014 ; Shormeh Dowuona, 2014).

The voters register for the 2012 and 2016 general elections was overhauled and maintained by Dutch firm GenKey (Marzin, 2015:6 ; GenKey, 2016). Biometric registration was supposed to prevent fraud and guarantee

the credibility of the vote. However, on top of being accused of wasting resources, the electoral commission failed to create a trustworthy environment. A Ghanaian think-tank, the Danquah Institute, released a report prior to the 2016 election highlighting for instance that deceased people had not been removed from the voting registers, opening the door to irregularities (Torny, 2016).

/ THE NEW GHANA CARD

Ghana is remarkable among the countries studied in this report by the number of local firms involved in the identity management industry. Biometric voter registration, for instance, was subcontracted in part to SuperTech, a Ghanaian company (GenKey, 2016).

The largest project in the field of identity management is a \$1.2 billion overhaul of the Ghana Card, which began in 2017 and was awarded to IMS Ghana, a subsidiary of Margins Group, a Ghanaian firm (which itself subcontracts much of the work to American, Dutch and German companies). The project is run under a public-private partnership, in which IMS Ghana is supposed to bring \$169m in exchange for a guaranteed return of 17% (National Identification Authority, 2018). Revenue will mostly come from the fees paid by Ghanaian administrations to IMS Ghana.

The new Ghana Card is touted as a silver bullet to finally centralize the several identity management systems set up over the years. It has been hailed by the credit scoring industry as a way to shore up the credibility of private borrowers and reduce interest rates (“National ID, Digital Property...”, 2017).



Rwanda

/ THE MOST ADVANCED IDENTITY DATABASE

The war of 1994 destroyed many civil registers in Rwanda, while the genocide was carried out using the official identity cards, the bearers of which were systematically killed when the word “Tutsi” was written on them (Fussell, 2004). Against this legacy, the new regime of Paul Kagame pulled out the old identity cards in 1996 and started an overhaul of the legal identification systems.

A comprehensive census making use of biometric identification was carried out in 2007. The goal was to unify all identity information under a single authority, the National Identification Agency (NIDA), and a unique National Identity Number (NIN) attributed to Rwandan nationals, resident foreigners and refugees alike. NIDA succeeded where its Ghanaian counterpart failed in that many institutions, such as banks, use the NIN as the main unique identifier of their users. This, coupled with the low price of the identity card (500 Rwandan francs or 50 euro cents), creates an incentive for the population to seek registration (Atick, 2016).

Rwanda hosted the ID4Africa event in 2016 and is largely seen as a front-runner in identity management. The government even plans to expand the identity database by collecting the DNA of the whole population, but no concrete plan has been announced (Bizimungu & Rwamapera, 2019).

However, the government’s efforts have yet to fully bear fruit. The latest UNICEF data shows that in 2015, barely half of children under five were registered (see graph 1 above).

/ UNEVEN BENEFITS

This biometric identity management can have very practical benefits. At the very busy border post between Rwanda and Kivu (Democratic Republic of the Congo), where 45,000 people transit every day, an automated passenger clearance system was installed. Gates require travellers to scan their identity document and their fingerprints. The new gates more than halved the time required to process a person, from 45 seconds to 13, thereby reducing the queues at the border (Byukusenge, 2018).

Identity management allows, as was the case in Ghana, for credit reference bureaus (CRBs) to operate. Energy, water, sanitation and telecom companies can share information about their clients with the CRB. The goal is to help banks better identify borrowers with a high risk of default and offer better terms to the others (Ngarambe, 2013). Or at least, this is the narrative put forward by the central bank of Rwanda when it announced the licencing of CRBs (“Credit reference bureau will...”, 2008). Data shows that the interest rate spread (the difference between the rate at which banks lend money and the rate at which they pay for money) increased steadily since 2013 and was at an all-time-high in 2017 (“Interest Rate Spread”, 2017), which is the exact opposite of the central bank’s prevision.

/ UBUDEHE: UNEASE ABOUT SOCIAL SCORING

Ubudehe is a poverty relief program created in 2001 and deployed in 2004 (Niringiye & Ayebale, 2012). Its particularity lies in the fact that leaders of villages (administrative units that average 700 individuals in the countryside and in cities) rank each household of their community in a category, based on their perceived poverty. Guidelines are laid out at the national level to describe each category from indigent to very rich, but no actual measurement of wealth or any other capability is required before making a categorization decision.

It is unclear from published reports if the categorization is made collectively or by village leaders only. The results of the categorization are collected on paper forms which are then aggregated at the sector level (there are 416 sectors in the country) and sent to Kigali for storage and analysis (Atick, 2016:29).

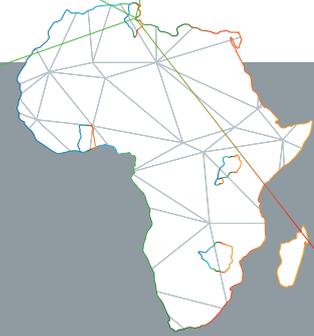
While Ubudehe is run by the Local Administrative Entities Development Agency (LODA), there were plans to use the NIN in the Ubudehe database (Atick, 2016:28). In other words, the Ubudehe score can be associated with any individual, biometrically if need be.

Rwanda is a military state (Purdeková et al., 2018). It has been consistently described as unfree by Freedom House since 1999 and journalists there are harshly persecuted (Reporters Without Borders ranked Rwanda 156th out of 180 in 2018, noting that there were “fewer abuses in recent years because most of the outspoken journalists have either fled abroad or have learned to censor themselves”).

Despite this limited freedom of expression, there is widespread unease about the omnipresence of the Ubudehe score. The lack of transparency in the way the score is built, the lack of accountability of those giving the score and the fact that some decisions, chiefly the entitlement to an array of public benefits, were linked to this single number was widely criticized in the early 2010's. In response, the head of LODA declared that the Ubudehe score was not meant to be used as the single factor in a decision (Kwibuka, 2014). A slight change was introduced thereafter, in that the original six categories, some of which had derogatory meaning, were replaced by four new ones, the names of which were more neutral.

These changes, however, did nothing to alter the fact that a low Ubudehe score is seen as a stigma (Niyitegeka, 2016). Several examples of Rwandans who were put in categories they disputed were covered in the national media. Some even argued that their score was changed when the data was input from the paper sheets into the electronic database at the sector level (Mbabazi, 2019). The most radical critics of Ubudehe call the entire system a fraud at the service of a police state, pointing in particular to the fact that the appeal mechanism cannot be realistically used (Ruhumuriza, 2015).

One of the most discussed aspects of the Ubudehe score concerned university scholarships. Thousands of prospective students with a score of 3 (the category for well-to-do households) were not eligible for scholarships but stated that they could not afford higher education. As a result, universities dropped the Ubudehe score in the scholarship assessment (Hakizimana, 2019).



Tunisia

/ A PRIVACY SUCCESS STORY

Tunisia is unique in Africa, if not in the world, for its quasi absence of biometric databases. There are several reasons for this state of affairs but the main one probably has to do with the 2004 law on data protection. Some say that then-president Ben Ali enacted this law not because he cared about data protection but because he wanted to shine at the World Summit on the Information Society held in Tunis in 2005 (Amel Belhadj, 2018).

The 2004 law created a national administration on personal data (INDP), which gave privacy advocates a voice of authority in the public debate.

After several attacks took place in 2015 at the Bardo museum and at Sousse, the French government offered to pay for a biometric database of the whole population, in a reminiscence of the SAGEM story in Ghana ("Comment la France...", 2015). In 2016, the interior ministry of Tunisia introduced a draft law for new identity cards that included a provision for a centralized database of biometric information. Throughout 2017, a debate took place in parliament and in the press over this biometric database, in which the chair of INDP, Chawki Gaddas, weighted heavily. After members of parliaments struck down the provision for a centralized database in 2018, the ministry withdrew its draft law (Mzalouat, 2018).

/ FREE ELECTIONS WITHOUT BIOMETRICS

As a result of the 2004 law and the general suspicion of centralized databases, Tunisia is the only country in the sample that yet has to hold an election using a biometric voters roll (Marzin, 2015 ; no biometrics are planned for the upcoming election of October 2019). Tunisia is also, remarkably, the only country in the sample where election results were not contested (in the 2014 general elections), thereby nullifying the argument of many hailing biometrics as a sure guarantor of fair elections.

In this context, we could not find a single example of a personal score, whether public or private, attributed to Tunisian citizens. The 2004 law prohibits the transfer of personal data without the express consent of the person the data relates to, thereby making it impossible for a data broker such as a credit reference bureau to operate profitably.



Uganda

/ LATE BUT COMPREHENSIVE EFFORTS AT IDENTITY MANAGEMENT

Uganda, which is by far the poorest and largest country in our sample, was late to enact a comprehensive identity management strategy but is now on track to follow in the footsteps of Rwanda towards building an integrated and centralized identity database.

The Registration of Persons Act of 2015 established the National Identification and Registration Authority (NIRA). Its goal is to centralize the databases that each institution had built. The National Identity Number (NIN) started to be used across institutions in 2017. Examples of planned uses given by the government include the land registry using the NIN to ascertain the property rights of landowners, or hospitals checking the NIN of patients to ensure that the same medication was not delivered twice to the same person (Kwiringira, 2017).

Concomitantly to the creation of NIRA, the electoral commission of Uganda contracted Suprema of South Korea and Zetes of Belgium to set up a biometric voters registration and install fingerprint readers at polling stations for the 2016 general election (Marzin, 2015). The stated goal was to prevent fraud but election results were contested by opposition leaders and criticized by international organizations such as Human Rights Watch. Social media was blacked out during one week during and after the vote (Paulat, 2016).

Biometric registration of the population continued thereafter, notably with a registration program for refugees living in Uganda carried out in 2017. The project, carried out by UNHCR and IOM, two agencies of the United Nations, showed that 1.1 million refugees were living in the country, 300,000 less than the previous estimate of 1.4 million (Burt, 2018a).

/ WIDER APPLICATIONS

In 2019, the Ugandan police contracted Gemalto of France to acquire fingerprints and other biometrics readers (Sesinye, 2019). It is unclear whether the police will be able to use these in conjunction with the biometric databases referred to above.

Credit reference bureaus began operations in Uganda in 2008. That year, South Africa's Compuscan, the first mover, set up its own biometric database, which contained one million individuals in 2013 (Odyek, 2013). Between 2011 and 2014, Compuscan introduced a single-number score to assess an individual's creditworthiness, which came with Codix, a tool that helps companies automate decisions based on that score.



Zimbabwe

/ AN ELECTORAL BIOMETRIC BLUNDER

Zimbabwe recently emerged from over a decade of economic unrest, epitomized by the hyperinflation of 2008 and the retirement of the national currency in 2015. Since then, a great many biometric initiatives have been launched, though they seem to lack coordination.

Unlike Ghana, Rwanda and Uganda, Zimbabwe does not have an institution dedicated to identity management. (Another piece of evidence for the country's lack of enthusiasm on the topic is the fact that ID4Africa has yet to invite a Zimbabwean speaker).

One of the first biometric endeavors in the country was biometric voter registration (BVR) prior to the 2018 general election. In what was expected to increase the trustworthiness in the election (Chindaro, 2017), the electoral commission tasked foreign companies with registering all eligible voters using biometric measurements. The process failed to lead to uncontested results, especially as the opposition claimed that voter rolls listed people who were 141 years old, among other inconsistencies (Associated Press, 2018).

The failure can be explained by the fact that the electoral commission contracted several companies to complete the BVR. While China's Laxton was tasked with collecting the biometrics of all voters, the data management and deduplication was given to another company, which is uncommon (a Laxton spokesperson said it was akin to "buying an iPhone and trying to load Android applications on it" ; Mhlanga, 2017a). The company chosen for deduplication was at first Nikuv, an Israeli firm which had been accused in previous elections of rigging the vote in favor of ZANU-PF, the governing party (Sole, 2013). Faced with public outrage, the deduplication was finally given to a United States company, Ipsidy (Perala, 2018). Laxton is currently suing in court over the decision, arguing that the tender was awarded to Ipsidy irregularly (Reuters, 2018). Finally, in what is believed to be the consequence of having too many companies involved and careless procedures, the biometric database was leaked a few weeks before the election after a cyber attack (Mhlanga, 2018).

Besides the technical and procedural blunder, this Zimbabwe election offers another insight at how biometric technology can be used against its stated goal of inclusion (the SDG 16). Although biometrics were only used for registration (not for votes), there are reports that voters were told, while registering, that the fingerprint readers had magical powers that would enable them to see how people voted in the future (Majoni, 2017).

Sorcery is still widely accepted in Zimbabwe (see Rödlach, 2016, for the influence of sorcery in health issues) and in many other African countries. The extent to which biometric machines are perceived as sorcery has, to the best of our knowledge, never been investigated and could greatly further our understanding of identity management in the sample countries.

/ MULTIPLE FORAYS IN BIOMETRICS

In 2016, and then again in late 2018, the government of Zimbabwe announced a plan to identify civil servants biometrically in order to reliably check their presence at the office and thus curb ghost workers. The specifics of the plan, however, have yet to be disclosed (Chindaro, 2018).

While this particular plan did not lead to a biometric database, several others did. In 2016, the agency in charge of small and medium enterprises (SME) which, in the Zimbabwean context, include street peddlers and other participants in the informal economy, announced a grand plan to biometrically identify all SMEs in order to tax them effectively (Lee, 2016). It is unclear how much progress has been made on this project, but the Netherlands' HSB Identification confirmed that it had been tasked with creating a biometric business register ("SME Register For Zimbabwe", 2017).

A government-owned credit reference bureau was set up in 2016 by the Reserve Bank of Zimbabwe (Mhlanga, 2017b) using software from the Czech Creditinfo. While the software promises to aggregate data from several sources ("Credit Bureau System", 2019), it is unclear which unique identifier is being used.

At the Beitbridge border post, Zimbabwe's busiest, the South African side introduced biometric gates (a project similar to Rwanda's biometric border crossing with Kivu). Zimbabwean authorities have been asked to register their nationals (Muleya, 2017). It is unclear how many Zimbabweans have registered for the scheme.

/ COMPREHENSIVE FACIAL RECOGNITION

The most ambitious biometric project in Zimbabwe is a comprehensive database of the population's faces and body characteristics, run by China's CloudWalk using 3D modelling, which is supposed to better capture the biometrics of dark skinned individuals (Burt, 2018b). Critics argue that the deal will help China build tools that let its companies handle all human diversity better than their competitors (American products are famously bad at identifying people of color ; Ferro, 2016).

While the details are not clear (Zimbabwean journalists have seen their requests for information declined), Zimbabwean police is acquiring CCTV cameras and software that could let it interact with CloudWalk's database. Some in Zimbabwe and South Africa expect the new Zimbabwean government to leverage this technology, which is mostly loaned or donated from China, to implement a severe police state modelled on the Chinese administration of Xinjiang (Mwareya, 2019).

China's social management systems

China's social credit system (SCS) does not exist as such (Hmaldi, 2018). Instead, a collection of systems exist, with the goal of rolling out a national, unified system in 2020. While it is often equated to a credit score by Chinese officials (Rupert & Shichong, 2017), the final SCS aims at providing a single measure of trustworthiness to be used by all institutions, financial and non-financial alike, the ultimate stated goal of which would be to increase trust throughout Chinese society by punishing untrustworthy individuals (Hmaldi, 2018 ; Creemers, 2018). This section focuses on the two systems that gathered most attention in the western media and offers a summary of other experiments.

/ THE JOINT PUNISHMENT SYSTEM

China's leadership established an array of measures intent on creating credit and trustworthiness scores in the late 1990s and the 2000s. In 2014, it formalized this policy and announced the establishment of the SCS for 2020. The first and, so far, only nationwide operational building block of the nationwide SCS is the Joint Punishment System (JPS).

The JPS is not a score. Instead, it is a series of dozens of memoranda of understanding (MoU) between organizations which exchange blacklists among themselves. Such MoUs usually involve one organization agreeing to restrict services or to offer faster treatment to someone on the basis of information from another organization (Daum, 2019a). These exchanges are only effective because all organizations use a single identifier for persons and for companies. A "big data warning list" exists which aggregates the identities of peoples and companies which appear in three or more blacklists (Daum, 2018).

As such, the JPS is not dissimilar from the United States' terrorism watch and no-fly lists, for instance, or from France's TAJ file (the *traitement des antécédents judiciaires* is a file listing 13 million individuals, against which job applicants for a variety of positions can be checked ; Rees, 2015). Unlike the no-fly list or TAJ, the JPS encompasses a variety of contexts. While it can be used to deny someone the possibility to fly or to obtain a job, a person can be blocked from travelling on the high-speed train network because she has been convicted of making a false claim (Wang, 2017).

The stated rationale for the creation of the JPS is not security. Instead, it supposedly aims at deterring untrustworthiness in society by making the enforcement of verdicts more all-encompassing. The JPS allows for information exchange between organizations on Chinese citizens who failed to comply with a court order or who have been convicted of fraud.

Many Chinese citizens see the JPS, and the SCS in general, very positively, as a possible technical fix for the very low level of trust across society (Hmaidi, 2018).

/ SESAME CREDIT

In 2015, the People's Bank of China, equivalent to a central bank, intensified its efforts to establish credit scores, imitating Germany's Schufa or the United States' Fico score, and tasked several private-sector firms with this mission. China's economy being mostly cash-based, most individuals do not have a credit history (by 2012, only 280 million had a credit score ; Creemers, 2018) and another approach was deemed necessary.

Of the eight companies that offered solutions, Ant Financials' Sesame Credit, a subsidiary of e-commerce behemoth Alibaba, saw the largest adoption. Sesame Credit is an opt-in feature of the Alibaba universe of products, similar to Google's or Facebook's in Europe. The Sesame score can go from 350 to 950 and varies according to a wide variety of inputs. Alibaba directors said for instance that buying nappies would drive the score up while playing video games would weight it down (this statement was later denied ; Creemers, 2018). Sesame Credit uses machine learning to sort people across categories, so that its inner workings are extremely opaque, notwithstanding the fact that no source code or documentation was ever released. An attempt at modellling only showed that the algorithm reacted with very high volatility to small changes in input (Hmaidi, 2018).

The large adoption of the Sesame Credit made it attractive for third parties. Close to 400 cities in China offer citizens to use it in their dealings with the municipality, in order to dispense high-scorers from paying deposits, for instance (Creemers, 2018). European institutions also make use of Sesame Credit. Luxembourg, for instance, in partnership with Alibaba subsidiary Fliggy, offers a "fast lane" to visa applicants with a higher score (Shihua, 2017).

From the point of view of the People's Bank of China, however, these experiments were a failure. Sesame Credit and the seven others saw their license as credit reference bureaus revoked as the bank saw that all tried to further their business interest more than they assessed the trustworthiness of their users (Creemers, 2018:24). An oft-quoted, if unverifiable, example is that Sesame Credit rewarded the use of Alibaba's payment service Alipay while downgrading the use of its competitor's WeChat Pay.

/ OTHER EXPERIMENTS

Within the general policy of using technology to fix the lack of trust in China, several cities came up with their own social credit systems. 43 of them were started by the 2014 national strategy (Kostka & Antoine, 2018) while around 30 more had been launched before (Hmaidi, 2018).

The available literature shows that none of the locally-run SCS used machine learning. It is unclear if any locally-run SCS uses data from friends or family to change an individual's score (Sesame Credit, on the other hand, claims it does). Instead, locally-run SCS use a catalogue-based approach, where a set of positive actions (volunteering in a charity, for example) rewards points while another set of negative actions (speeding, jaywalking, defaulting on a loan) removes points. The scores can be used to fast-track or delay applications for jobs, schools or social services. Public displays of scores, such as billboards of the best households, are commonplace.

Not all experiments gained approval of the central government. Suining, a 3-million-strong city in the Southwest Sichuan province, began an SCS in 2010 with a single, centrally-defined catalogue. After a public outcry comparing the system to a 1942 Japanese purge in which non-Communist Chinese were given “good citizen cards” by the occupying power (others were executed), the system was retired in 2016 (Creemers, 2018:12).

A more successful example is being run in Rongcheng, a city of 700,000 in Shandong province. There, several behavior catalogues were written by different stakeholders (companies, city districts etc.) so that no single authority defined what made a trustworthy citizen. This decentralized approach was rewarded by the national authorities, which declared Rongcheng one of the twelve best pilots for the nationwide SCS (Hmadi, 2018). Rongcheng made the list of actions that influence one’s score public and clear. For Jeremy Daum (2019b), the Rongcheng system is closer to an extended driver’s license point system than to Black Mirror’s Nosedive episode, in which people rate one another after every social interaction.

There are many less ambitious programs as well. Shenzhen, for instance, uses facial recognition combined with CCTV cameras to fine repeated jaywalking (Creemers, 2018:18).

There is still a very large uncertainty regarding the system to be deployed nationally in 2020. Antonia Hmadi (2018), an economist, doubts that the ultimate goal of the Communist authorities - merging information about the ability to repay a loan with a measure of trustworthiness - will ever be reached, were it only because, by blurring financial information, the very purpose of the credit score is weakened. (Under the current plan, the SCS could lead banks to lend to borrowers with no assets and no revenue but very high trustworthiness). Moreover, she argues that some SCS contain features similar to the indulgences of the Catholic church, where richer citizens can simply pay to see their score go up. As such, the SCS would also fail in its mission to increase trust across the Chinese society.

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