Identifying 1.3 Billion Indians Biometrically

Corporate World, State and Civil Society

Nicolas Belorgey
Research Fellow, CSH-CNRS
and
Christophe Jaffrelot
Research Director, CERI-Science Po/CNRS
Professor, King's India Institute (London)

About

Heidelberg Papers in South Asian and Comparative Politics

This occasional paper series is hosted by the Department of Political Science of the South Asia Institute at the University of Heidelberg. The main objective of the series is to publicise ongoing research on South Asian politics and provide open access to the international community of scholars and policy makers and those interested in the region. The e-papers are available online and can be downloaded at –
https://crossasia-journals.ub.uni-heidelberg.de/index.php/hdpapers

The series draws on the ongoing research projects at the South Asia Institute in Heidelberg, seminars by visiting scholars and the wide scholarly network engaging with South Asia. The opinions expressed in the series are those of the authors, and do not represent the views of either the University of Heidelberg or the Editorial Staff.

Contribution to the Heidelberg Papers is exclusively by invitation.

First published in 2020 as Nᵒ 251, "LES ÉTUDES DU CERI," titled, "L'identification biométrique de 1,3 milliard d'Indiens. Milieux d'affaires, Etat et société civile." Available at https://www.sciencespo.fr/ceri/sites/sciencespo.fr.ceri/files/Etude_251_0.pdf

Introduction

Digital technology has today become entrenched globally like a new wave of innovations (in the Schumpeterian sense), much as the steam engine or electricity did in their times. Some hail it, like the World Bank, which heralds budding "digital dividends," even though its attainment still encounters many obstacles.[1] Others deplore it, seeing in it a new phase of surveillance capitalism, marked by the expropriation of private experience and an unprecedented asymmetry of knowledge, wealth and power.[2] At the heart of this controversy lies the status of personal data on which this new economy is based: third party access to these data may turn out to flout privacy.[3] Such technology can be developed only if people are individually identified through various means; for example, facial recognition in China or "e-state" as practised in Estonia.

Our interest here is in one such digital tool: Aadhaar ("foundation" in Hindi), which is lesser known but is far-reaching, as it aims to biometrically identify the entire Indian population of 1.35 billion people. Over 1.25 billion people, i.e., 92 percent of India's population have already been registered under Aadhaar, and the technology is now being exported to many Asian and African countries.[4] It was instituted with the founding of a dedicated agency in 2009, the Unique ID Authority of India (UIDAI),[5] headed by Nandan Nilekani, co-founder of Infosys, a world leader in IT consulting.

Materially, the system is quite simple. During the initial enrolment, a person provides their biometric information for collection: a print of ten fingers, scan of both irises, as well as name, date of birth, address, and, optionally, phone number and email. These data are collected across the country at dedicated enrolment kiosks, for example, the hall of a post office or that of a bank. Next, the data (roughly 3MB per person) are sent by internet to the UIDAI central server, called the Central Identities Data Repository (CIDR). Here, algorithms run checks for duplication and generate a random 12-digit number. Thereafter, the applicant receives a paper card bearing their identification number. At the other end, when a person needs to prove their identity during an authentication procedure, they provide this number and their fingerprints. These are sent online to the UIDAI, which then responds with a "yes" or "no" on whether these two factors match, which should confirm that a person really is who

they claim to be. It may also, on request, disclose the other information in the database, except the biometrics.

This digital identification can only be understood when placed in a broader context. Reflecting the name of the file, Aadhaar lays the foundation for creating exhaustive files on a large scale. It is of enormous interest to a variety of groups simultaneously. It is a dream for scientists due to the sum of accumulable knowledge; for a merchant, due to monetisation of personal data, as companies like Google and Facebook do; and for politicians due to the surveillance and control of people it enables the State to conduct. Population mapping becomes a faithful and exhaustive representation of this dream. It can, however, also become a nightmare. One could even say that a population map is no longer separate from the territory: it becomes the territory's virtual representation.

Taking Aadhaar in its literal sense, this working paper theorises that this mechanism paves the way for a twofold recasting of the Indian State. First, in the economic sphere, it contributes to "valorising" of the population in a mercantilist sense, as a source of wealth for the nation and as a vital driver of the country's economic growth. Next, in clearly a more statist perspective, this mechanism authorises widespread surveillance. Developments over the course of time suggest that Aadhar has moved on from the first to the second perspective. Initially rooted in the mercantilist sphere under a coalition government led by the Indian National Congress, it gradually changed, particularly after the Bharatiya Janata Party (BJP)-led Hindu nationalist government assumed power in 2014, into a mechanism for surveilling the people.[6]

The project
The project was conceived initially by the corporate sector, particularly the information and technology (IT) sector, but was subsequently recast in order to make it acceptable for the State.

An IT sector initiative
For information and communication technologies, identifying users is a crucial matter.[7] This is quite apparent on e-commerce sites. Since the invention of permanent identifiers or login credentials, euphemised as "cookies," online sellers can track visitors to their website. This enables them to adjust prices based on what they deduce clients are willing to pay, arming

them with the means to make the consumer spend more than they had intended. The well-known case of online air ticket pricing illustrates this: with each visit that a particular user makes on the seller's website, the prices rise. This identification of individuals has also made online advertisements spike ("when ads started following you around the web," as B. Schneier put it), which is a vital source of income. The identifying power of cookies was paradigmatically demonstrated in a 2012 case, when an American adolescent's father found out that his daughter was pregnant when she started receiving targeted postal advertisements thanks to the department store retailer, Target, analysing her online behaviour data.[8]

However, beyond the relatively well-charted context of the Internet and developed countries, the identification of individuals is not always reliable. Certain information do, in principle, help identify a person, such as their name, date of birth, place of residence, etc., or a combination of all these. However, these elements are not always reliable, particularly for sizeable and/or vulnerable populations. In India, the penetration of personal computers is relatively low. Many people bear the same name, and often names may be spelt differently in different documents of the same person. Dates of birth may be uncertain (first of January is often the assigned date when only the year of birth is certain). Residential addresses may change, particularly for migrant workers, who are also of a sizeable number. In such a context, the statistical reliability of data mining is in free fall, and with it, the profits of IT companies. In this context, a reliable "unique" identifier based on biometric technology becomes very valuable, as it may be the only means of guaranteeing the identity of a person, even if they do not use the Internet, bear a very common name, or are unaware of their date of birth.

People's biometric identification, particularly in the global South, is promoted by global IT giants through their non-profit ventures, such as Microsoft (Bill & Melinda Gates Foundation) and eBay (Omidyar Network, Pierre Omidyar being the founder of eBay), which have forged ties with the World Bank on these matters. The World Bank, in fact, promotes digital technology such as biometric identification through various institutions it hosts, but which are essentially financed by Microsoft, Omidyar or other IT companies. Notable examples are Identification for Development (ID4D) and Consulting Group to Assist the Poor (CGAP).

In India, a crucial actor in the movement for biometric identification of people is Nandan Nilekani. In 2009, he was appointed the first chairperson of UIDAI with the rank of a minister. In the 2010 Bill, which aimed at conferring a legal foundation on the programme, the chapter on the agency is entirely structured on his person. Who is Nandan Nilekani?

Nandan Nilekani was born in 1955 in Bengaluru, the capital of Karnataka. An engineer from the prestigious Indian Institute of Technology (IIT) Bombay, he worked for three years in an IT services firm in this city before co-founding Infosys in 1981 with six other engineers, and an investment of USD 250. Two years later, it would be one of the first software companies to set up operations in Bengaluru, which would go on to become India's Silicon Valley.[9] Infosys exemplifies the Indian firms that made the most of economic globalisation. Providing services to companies all over the world, and an outsourcing destination for major American consulting firms, it provided high value added, specialized expertise, such as business strategy consulting for information systems and their development.[10] India's IT sector, worth 8-billion-USD in 2000, grew to 64 billion USD in 2008, registering an annual growth of 40 percent over this entire period. Infosys reported a turnover of USD 1.6 million in 1991, 100 million in 1999, around 1 billion in 2003 and 3 billion in 2007, their clientele including multinational giants such as Sainsbury and Airbus. Nilekani was the CEO of Infosys from 2002 to 2007—a phase during which the company expanded most rapidly. In 2003, the *Fortune* magazine named him "Asia's Businessman of the Year." In 2006 and 2009, the *Time* magazine ranked him among "The 100 Most Influential People in the World."

In 2008, the Great Recession affected the whole world, starting with the United States. Infosys and the IT consulting sector in general saw their markets shrink. Numerous Non-Resident Indians (NRIs), employed in the United States returned to India, where the job market remained relatively less affected. In the same year, Nandan Nilekani published a book, *Imagining India*, a sort of roadmap for the country, written from a classical economic liberalism viewpoint, criticising state intervention and lauding private enterprise.[11] He wrote:

> When I first became involved in the public sphere, I consciously avoided pitching IT as a means
> of solving public problems. I was wary of being labelled a 'computer boy' who saw every
> problem as something that could be solved by writing a piece of code [...]. But after a decade of

work on public issues [...], I do not see how things can be improved in the public sector without a massive dose of IT.[12]

The chapter on IT in India is very close to what would become the set up for Aadhaar. Here, he not only recommends one national identification but also a raft of innovations that this would permit. Nilekani would repeat the same authorial operation seven years later with *Rebooting India*, co-authored with Viral Shah, in which he presents IT as the solution to India's various problems.[13] In 2009, his move to UIDAI surprised India's corporate world. As Charles Assisi, a renowned journalist, told the authors in an interview: "We knew Nandan as a corporate person, who was very intelligent and articulate. We couldn't understand why he would want to get into government, because our perception of the Indian government is as a hopeless place where nothing can be done."[14] One possible explanation is his repositioning on another scale. "The backstory that Nilekani shared with us was very interesting. (…) Infosys was too small for him and he wanted to do something very big."

In this sense, Nilekani comes across as something of an Indian Bill Gates. Apart from Nilekani, the entrepreneurial origin of Aadhaar is confirmed by the interest that this project generated in the IT sector. Vastly differing, as one finds firms comparable to Infosys, such as Wipro, as well as myriad individual entrepreneurs, often from the IITs and/or linked to US firms, this sector was gradually structured. It even acquired a new institutional entity with the establishment of the Indian Software Product Industry Roundtable (iSPIRT),[15] which supported the Aadhaar project when it was at a nascent stage. In a public document, iSPIRT formalised its interest in Aadhaar as the first foundation stone of a much greater edifice, India Stack, in other words, a stack of four FinTech innovations.[16]

In September 2010 [when the Aadhaar technological platform was officially launched], India set out on an arduous journey […] that would prove to be the beginning of a FinTech revolution for the country […]. The availability of biometric information has opened up a plethora of opportunities through the addition of an open technology platform [or API: *Application-programming interface*]. […] A technology platform is anything that serves as a foundation upon which other applications, processes, businesses and technologies can be developed. The platform essentially bears the 'fixed costs' of developing certain functionality and opens up this

functionality to the world so that people can innovate without the burden of massive upfront investments.

Right here is one of Aadhaar's *raisons d'être*, which was later revealed: IT sector designed an identification tool that they considered indispensable for the private sector to flourish. Had Nandan Nilekani not used the famous expression, "Data is the new oil?"

India Stack, more specifically, is a set of four innovations or layers, conceived on the basis of biometric identity (Figure 1): first, a *presence-less* layer that helps identify or to "Know Your Customer (KYC)," which thus becomes an eKYC, as UIDAI can also send the customers' demographic information, such as name, address, phone number and email; second, a *paperless* layer, or Digilocker, which helps authenticate and store digitised documents; third, a *cashless* layer, which enables payments between two people, who have thus been identified, via the new Unified Payment Interface (UPI), a solution that did away with India's previously siloed payment system; and lastly, a *consent* layer through which the individual would authorise third parties to manage their data.

Figure 1: India Stack
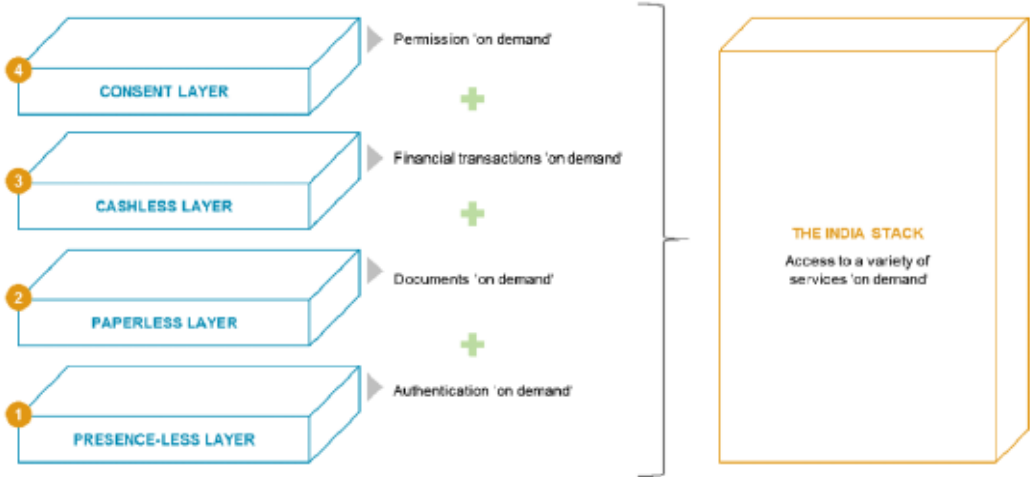
Source: India Stack, aforementioned document.

While the Aadhaar project was conceived in the private sector, the State alone could make the investment needed for carrying it out. How was the State to be convinced?

Financiers' overwhelming influence within the State

To understand the rationale behind the Indian State's adoption of a digital identity project, one must go back to the political context of the times. Faithful to the Congress' liberal and social-democratic line, the UPA government, which ruled India from 2004 to 2014, endeavoured to pursue both economic liberalisation and a policy of redistribution to the poor. The latter aim translated into passing several social welfare laws: Right to Information (RTI) Act 2005, a weapon to combat corruption; the National Rural Employment Guarantee Act, (NREGA) 2005, guaranteeing 100 days of minimum wages to each rural household; and the National Food Security Act (NFSA), 2013, for the provision of food grains based on socio-economic criteria through a network of fair price shops under the State's Public Distribution System (PDS). Along with other social protection reforms such as the National Pension Scheme and Direct Benefits Transfer for LPG cylinder subsidies, these policies drew scathing criticism from economic milieus: they would be a drain on the State budget, which already suffered from chronic deficit.[17] On the one hand, as Dipa Sinha pointed out, in the Parliament,

> […] almost every speaker, irrespective of his/her past position or statement outside Parliament, came out in support of the right to food and the State's obligations towards the poor and hungry. More than 300 amendments were introduced by various parties, most in favour of expanding the scope of the Bill. [On the other hand] … most of the mainstream media lamented its passage, blaming it for everything that was wrong with the Indian economy.

One major criticism had to do with leakages in social benefit schemes, as only a fraction of the State allocation would actually reach the beneficiaries due to the pickings by all manner of intermediaries. Montek Singh Ahluwalia, the Deputy Chairman of the erstwhile Planning Commission (the Prime Minister was the *ex officio* chairman of this organisation) throughout the Manmohan Singh governments, and an erstwhile career economist at the World Bank and a high-ranked official at the Ministry of Finance in India, estimated in 2008 that only 16 percent of the funds allocated for NFSA actually reached their beneficiaries. This observation recalls Rajiv Gandhi's comment in 1985 on social protection programmes in general.[18] This form of corruption, obviously, created many material problems for the short-changed beneficiaries whose rights were curtailed, but they also had political implications for the Congress, as it led to the rise of an anti-corruption movement (India against Corruption) unprecedented since the 1970s. Led by a veteran Gandhian, Anna Hazare, this movement

found political expression in Arvind Kejriwal's Aam Admi Party (AAP), or the Common Man's Party, which won 28 seats against eight to Congress in the Delhi state elections of 2013. Lastly, this form of corruption also had financial repercussions for the State as almost 85 percent of the public funds allocated for these social protection programmes were thus frittered away. A preliminary response to these problems was floated: why not replace the Public Distribution System (PDS) in kind, which calls for numerous intermediaries, with a direct transfer of benefits in cash? This features in the UPA's [19] 2004 election manifesto.

Congress leaders as well as high-ranked officials of the Finance Ministry supported the project. Pranab Mukherjee, an influential member of the Congress and Finance Minister during the UIDAI's initial phase (2009–2012), is said to have met Nilekani shortly after his nomination in 2009 and sealed an alliance with him: "[He] heard him out and issued a *carte blanche*—Nilekani could come to him whenever UIDAI faced a problem on the project."[20] Thus, the State's financial arm might have seen digital identification as a practical solution for resolving longstanding problems, such as leakages in transferring public funds.

The heavy influence of financiers can also be gauged from Aadhaar's edging out of rival individual identification projects. In 2000, following the 1999 Kargil War, during which Pakistanis infiltrated parts of India-administered Kashmir and blended with the people living along the border, the Indian government had asked another private sector major, Tata Consultancy Services (TCS), to bring out a Multipurpose National Identity Card (MNIC) to facilitate ID checks. The enterprise was overseen by the then Minister of Home Affairs, L.K. Advani, and a pilot project was carried out with 3 million people spread across 12 states. The major difference with UID lay in the fact that the cardholders' information was stored in an electronic chip inserted in the card, which potentially enabled its holder to always be the custodian of this information. In 2009, along the same line of thought, in the aftermath of the 2008 Mumbai attacks, whose perpetrators had reached the Indian soil by sea, the Ministry of Home Affairs floated the idea of ID cards for inhabitants of coastal villages.[21]

However, at the same time financiers supported initiatives in a different vein, in line with the UPA's Common Minimum Programme, a unique ID (UID) for "below poverty line (BPL)" families for better targeting of PDS. This project was spearheaded by the Ministry of

Information Technology and Communication, with the technical assistance of the Planning Commission. The direct competitor of Infosys in the IT sector, Wipro, also based in Bengaluru and even larger than Infosys, offered its consultancy services. In August 2007, this group, which also included the Ministry of Home Affairs, proposed to establish a "UID Authority."

Prime Minister Manmohan Singh entrusted Pranab Mukherjee (then the Minister of External Affairs) with chairing an Empowered Group of Ministers (EGoM), which finally decided in January 2009 to establish a UIDAI under the Planning Commission. A clash—which had heretofore been latent—then erupted between the Ministry of Home Affairs, which continued with its MNIC project, based on the national census (National Population Register [NPR]), and the UIDAI champions. Mukherjee's arbitration, aimed at satisfying both parties, recommended building a joint database, merging the NPR, which had the blessings of the Home ministry, and the UIDAI project that was to become Aadhaar. In keeping with legal texts, the former would only be in charge of citizens and issuing them a smart card, while the latter would only be in charge of residents, whom they would identify through a number. This compromise implied a territorial dimension as the NPR was concerned with India's border states. Carried out under the leadership of Pranab Mukherjee, this compromise advanced the UIDAI's cause by protecting it from its main rivals: the Home ministry and the NPR, who were already mandated with carrying out the population census, but without the facilities, that Aadhaar was to develop. Later, under P. Chidambaram, the Home ministry would again oppose the UIDAI to promote the NPR, but without much success. When this politician's portfolio changed to Economy and Finance, he would, in turn, actively promote Aadhaar.

Other members of the Congress, particularly its Vice-President, Rahul Gandhi, also promoted digital identification for other reasons. He wished to make the delivery of social welfare schemes more efficient, in a perspective combining the technophile modernism inherited from Rajiv Gandhi, or even Nehru, and the desire to plug corruption. In fact, Rahul Gandhi pushed for N. Nilekani's appointment in the UPA government in 2009.

Prime Minister Manmohan Singh eventually accepted all the conditions imposed by the businessman who was yet to become a member of the Congress (a party on whose ticket he

contested only in the 2014 elections): directly reporting to the Prime minister (through the Planning Commission); rank of a minister (an exception in practice as, in principle, only the Vice-Chairman of the Commission had this privilege); an official announcement (on 25 June 2009) specifying that he did not demand an entry in the government but that the latter "invited" him; and an assurance that passing the law to solidify the UIDAI would be a priority on the coalition's agenda.[22]

How to register one billion persons?

Once the UIDAI was established, executing the project that would become Aadhaar required three steps: finding allies in the administration as well as the corporate world; registering a maximum number of people, ideally all 1.3 billion of the population; and overcoming objections.

Finding allies

The first allies necessary for successfully concluding any action under the State are those who are its daily embodiment: the bureaucrats. This alliance was a particularly delicate matter for a project whose driving force, Nilekani, was a total stranger to the structures of the State. But he found relays amid high-ranking officials the UIDAI engaged. Foremost among them was Ram Sewak Sharma, an Indian Administrative Service officer with an atypical academic background, being an IIT Kanpur graduate (1978) with a Master in Computer Science degree from University of California, Riverside (2002). A significant number of Aadhaar's torchbearers were IIT alumni, like Nilekani. They shared an engineering culture and belonged to the same circles. Speaking about this, R.S. Sharma said of Nilekani: "He did not know about me really; we had a common friend who told him about me."[23] Before being inducted at UIDAI, R.S. Sharma had served in various positions at the Ministry of Finance, notably interfacing with the World Bank. He drew on his IT expertise when posted in Bihar. Thus, he is credited with solving 22 criminal cases in one month in 1986 thanks to an algorithm crossing individuals in possession of firearms with police records.[24] Often, he would run foul with local politicians, earning him frequent and abrupt transfers. In 2009, Nandan Nilekani recruited him for the post of CEO of the nascent UIDAI.

The division of labour between the Chairman and the Director-General was of external and internal functions. As Nilekani briefed Sharma: "[…] you will execute the project, I have to

manage the ecosystem."[25] In practice, this meant that a part of the work was outsourced, while the design remained the prerogative of the "reactor core." This market model was extensively used vis-à-vis Indian administration too. Hence, the latter became the second major category of allies supporting the project, the first being the UIDAI staff, properly speaking. Encompassing both central and state government administration, they were necessary allies. They alone could push Indian citizens to register in the Aadhaar database, as India's federalism confers crucial powers on the states for the execution of social welfare policies.[26]

Central or state administration were allies with an ulterior motive. The potential for collecting information on the population opened up by the project, be it sectoral (for central government administrations), or geographical (for that of the states), created tempting possibilities in terms of economising on public funds or better targeting of policies. Nilekani and Sharma actively prospected bureaucrats between July 2009 and February 2010: Ministries of Petroleum, Labour, External Affairs, Rural Development, Department of Tax and Revenue, Post, Shipping, Aviation, Army, etc., as well as the chief ministers of all the states or their representatives. "The idea was to secure a buy-in for the idea of unique identity, source partnerships, understand regulatory issues, and the depth and width of their databases." [27]

Starting from 16 pre-existing fields of the Home ministry, which were the basis for consultations with the ministers and the states (mainly containing civil status, address, photo and fingerprints), "many departments in ministries wanted UIDAI to expand the data field. They wanted data on blood group, disability, religion, ethnicity, income-related information, and so on and so forth. The tendency of governments, driven by the 'it may be useful' line of thinking, is to ask for and collect data that may or may not be necessarily germane to the objective […]. If some agency is collecting data, add to the list."[28] However, these requests could slow down the project's implementation. Therefore, the IT consultant offered the Indian administrations a tailor-made service: they could develop, if they so wished, their own database with all the possible fields in addition to those mandatory under Aadhaar, the only ones that would be initially collected. The overall project was termed Know Your Resident (KYR), a facility lifted from the KYC (Know Your Customer) offered to companies. In exchange, the administrations agreed to become "registrars." This term is borrowed from the legal domain, or information technology, where it designates, for example, the few

institutions that register Internet domain names hosted in practice by a multitude of servers spread across the world. This means that the institution in question is involved in a decisive way in registering people.

The third support for Aadhaar in its infancy were the private companies that were successfully integrated in its *modus operandi* of sub-contracting data collection, to be paid on a piece rate basis. As indicated by Sharma: "The government was not able to do the work [required by Aadhaar]. Therefore, we used the private sector also. […] We created incentives for the private sector, by paying well. [29]

More specifically, these allies can be divided in three categories. The first is that of major companies, which like the administrations play the role of registrars. They, too, hold major client portfolios and therefore are deeply interested relays for registering huge volumes of population—and making a profit out of it (more on this later). The UIDAI made them sign the same type of contracts as the administrations. A perusal of the documents shows that these essentially involved big banks.

Thereafter, came the enrolling agencies, i.e., the sub-contractors of the registrars. At the other end of the chain, the former are, in fact, those who actually carry out the physical operation of registration, following specifications laid down by the UIDAI. As R.S. Sharma explained to the authors:

> [R.S. Sharma:] How do you enrol people? We decided that we will not purchase enrolment equipment and we will not do it this way, but we will do it with a public-private partnership. We will control what we have to control and we will outsource the rest […]
>
> [Authors:] What were the different roles played by each?
>
> [R.S. Sharma:] Multiple, for example we controlled the software for enrolment, it was developed by UIDAI, the enrolment was done by private sector people and we paid them on an outcome-based basis, which means that we were paying them X amount if you give us good quality data of one gentlemen/lady for generating the Aadhaar number.[30]

Lastly, UIDAI mobilised a number of individuals interested in this adventure, either against payments up front, or on a voluntary basis with prospects of future gains. First, UIDAI contracted players from various sectors; for example, it floated a call for a tender for identifying a designer to come up with a logo that would attract enrolment, for which the awardee would receive INR 100,000. Next, it recruited IT sector executives—some of them returnees from the United States due to the 2008 financial crisis. Many of them worked on a voluntary basis. Paul W., who worked on Aadhaar before becoming a consultant at the World Bank (and wished to remain anonymous), knew a few of them:

> Nilekani is really good, truly brilliant. He brought over all the small engineers, poached them and put them on a plane from Silicon Valley in style and promised them, 'You won't be very well-paid, but we'll make it worth your while' […]. I got the impression that some of them were kind of waiting for the cash-back moment and that they had overlapping interests in private businesses […]. These people were involved in the Aadhaar programme at some point and want to generate income today. One sees them everywhere as they gravitate towards [international organisations]: PWC, Ernst & Young, World Bank, and so on.[31]

Once these allies had been mobilised, there remained the toughest part of actually enrolling the entire population.

Biometrically identifying 1.3 billion people

For this, two major issues had to be resolved: technological ones but more so that of enthusing and exerting pressure on people to make them enrol.

Technological issues

Uniqueness and biometrics

The main aim of the IT companies, it may be recalled, was to irrefutably identify individuals. Their number one problem, as R.S. Sharma explained, came from the fact that "one person can have two identities."[32] That was why priority was given to "de-duplication," a neologism stemming from programming languages and meaning that the username of an individual would be checked against all the others in the database to ensure that it did not already exist. We translate it as "singularisation."

Therefore, the first task that the UIDAI tackled was to find a satisfactory technology for singularising a person. To this end, it set up several deliberation committees that took a few months to take decisions.[33] Biometrics was finally chosen, as it appeared to be the most reliable system. Recording fingerprints—recycled from police identification methods and the old practice of the British—was, however, deemed insufficient, as it still left much room for confusion.[34] It was decided that iris scans would be carried out and analysed with an algorithm, in accordance with a procedure invented by an American nuclear agency and commercialised in the 1990s.

The digital de-duplication process was a technological and commercial challenge on a vast scale. Only a few French and American companies worldwide were capable of doing this on a sufficient scale. UIDAI pitted them against each other, not only during market entry but also during its execution, in keeping with its usual incentive-based system for sub-contractors, as R.S. Sharma explains:

> The providers were in competition for us with three requirements: accuracy, speed [of execution], hardware requirement. A [mathematical] formula aggregated these preferences, and the more efficient of the providers would have a bigger share of the pie.[35]
>
> [….]
>
> The only private technology we used was biometric de-duplication technology because we do not have any open source, scalable technology for biometric de-duplication. Hence, we hired [...] multiple service providers and that was very important because if we only hired one company [...], we will never come to know what the truth is. But if we hire three different ones, we can crosscheck with the other two. Therefore, we can check their accuracy, speed and we created a formula whereby if they will not be able to scale up, we will throw them out and replace them.[36]

In the end, authentication errors were lower than 1 percent.

> The iris plus fingerprints made it possible to have an accuracy of more than 99% so even now one person can have two identities because this thing is not 100% accurate but there is no system which is 100% accurate.[37]

This can appear to be a low percentage; hundreds of commercial applications in numerous countries accepted it. However, applied to 1.3 billion persons, sometimes as a gatekeeping mechanism to provide basic relief, it means that around 13 million among them will not have been correctly authenticated, which includes the risk of their basic social rights not being recognised. These errors are one of the criticisms that have constantly been levelled against Aadhaar for over a decade by its opponents. [38]

The practical difficulties of enrolment and authentication

In addition to their biometrics, obtaining reliable information from the enrolled persons on their name, date of birth, residential address (which the UIDAI terms as "demographics") was another major challenge. As R.S. Sharma explains:

> Identity is such a circular process that if you have one identity document, you can always create another one based on the first, but if you do not have any, how do you say that I am X, what proof do you have? How do I prove to you that I am R. S. Sharma? That was a serious problem because many people in this country do not have valid identity documents. People have ration card, for example, these are family documents, and so in situations where you do not have any identity paper, how do you create the first one?[39]

The enrolment operations have been described by ethnographer Tarangini Sriraman, who spoke to porters (also called *coolies*) at an inter-state bus terminal in Delhi and in two enrolment centres in the north of the city.[40] Through a historical comparison with the Partition period and the issuance of ID cards in the 1990s to slum dwellers, she demonstrates how people saw their rights drastically reduced with the biometric ID. Whereas informal documents and oral statements used to be partially accepted by high-ranking public servants, the new identification programme considerably raised the requirements with regard to proof of identity (PoI) and proof of address (PoA), the two documents that people needed to give the enrolling agencies in addition to their biometrics. For instance, UIDAI refused the porters' union cards during a very long time before shifting its position. Yet, these porters are mostly migrants from rural areas, working in the city, where they live in the dormitory of a union, which protects and controls these workers with precarious incomes. This card—for which they already had to prove their credentials by showing their family ties with their village of origin and accepting the rules of collective urban labour—thus organises their identity in this

new context. The difficulties they encountered show that the enrolment was not a vast, generously "inclusive" operation as official discourse would have it, but was closer to police controls with the UIDAI drastically questioning all the other systems of belonging and identification.

After enrolment, authentication, too, raised a number of issues. Reading biometric data and linking with the CIDR require electrical devices and internet connectivity. These conditions are not always available, especially in rural areas. Flawed procedures exist, such as temporary storage of data and sending it later once internet connection is available, or disconnection between authentication and the rest of the process. Bidisha Chaudhuri, for instance, narrated how she had seen a complete separation between the authentication process in a ration shop distributing food grains sent through PDS and the actual distribution of the food.[41] The shop owner explained that due to the poor internet connection, he was compelled to carry out the authentications from the roof of the building. He would give a paper receipt to the applicants, who could then come to the shop "whenever they wanted" to collect the rations they were owed.

There were other situations, too, that led to the system's failure. Thus, in certain regions of Gujarat, the lack of internet connection led to people being refused food rations.[42] In tribal areas of the same state, the lack of electricity hampered enrolment.[43] Other flawed systems finally involved showing one's classic ID cards, such as the voter identity card; in such cases, there is little difference with pre-Aadhaar identification methods.

The problems encountered during enrolment were aggravated due to the poor quality of manual labourers' fingerprints—a sizeable population in India whose fingerprints were often faded—and the arbitrary circumstances of enrolment and authentication. A report by the agency reveals, "accuracy drops precipitously if attention is not given to operational processes."[44] In 2012, when 229 million UID numbers had already been generated, 384,000, i.e., 1.6 percent of these were junked by UIDAI as "fake," whereas this was actually due to faulty enrolment.[45]

Ultimately, R.S. Sharma acknowledged that flawed procedures are inevitable, with the failure rate, irrespective of the various causes, standing approximately at 5 percent:

> We have always said that you need to create an exceptional handling mechanism because Aadhaar works for 95% of the cases, there may be an issue with 5% so you please handle these cases yourself and do not completely depend too much on technology, you are not robots.[46]

In its current version, there are three types of enrolment procedures: the classic one, by producing PoI and PoA; through proxy by the head of family who is already enrolled; or through a third person, who is duly enrolled, serving as an "introducer."

Security violations: outlines of a typology

Breaches were detected at three stages of the system: enrolment, authentication, and, above all, data storage.[47]

First, at the initial enrolment stage, it was observed that fake cards bearing fake numbers were available on the black market at trifling prices, for example, INR 5 for a number or a card in the streets of Hyderabad, perhaps lesser for bulk purchases in Delhi or Mumbai. However, these counterfeits would not pass the scrutiny of authentication, so their existence is rather akin to artificial jewellery. On the other hand, more problematic are the abuse of Aadhaar numbers allocated not only to those who should not have received them at all—such as Pakistanis or Bangladeshis who are not really residents of India—but also fictitious entities, which might have been created by opponents of Aadhaar precisely with the aim of showing the system's vulnerabilities. Thus, cards were issued to animals, the monkey god Hanuman, and so on. These different cases all show the unreliability of the system. Frauds can occur during authentication as well. A Kanpur gang thus collected the fingerprints of users whose Aadhaar numbers they had stolen to resell the replicas at INR 5,000 apiece. This matter reveals complicity internal to the Aadhaar system, and the UIDAI ultimately "blacklisted around 49,000 operators for corrupt practices."[48] Using fingerprints digitised this time on scanners properly speaking, the well-established Axis Bank, on its part, made hundreds of fraudulent authentications without the real Aadhaar cardholder's presence.[49] For this, it sufficed to use the "replay" function of the device.

Further, doubts remain over the integrity of the data recorded. This data is first stored with the enrolling agencies. Some of these agencies then published online, not the biometrics—to which they are not supposed to have access in principle—but their clients' numbers, which is highly problematic. There are doubts even as to the reliability of the biometric software, which could have backdoors that enable their manufacturers to collect these data. The numbers then pass on to the registrars like the states and the banks, where they are stored along with a number of other personal information. It is mostly at this stage that so-called confidential data was leaked many times in the 2010s from official websites—whose security was ensured only gradually and uncertainly by the authorities.[50] Nearly 13 such leaks were discovered in 2017, 12 of them happened due to the negligence of official bodies. Each of these concerned between 12,000 and one million people, whose basic personal data were mistakenly made public.

It was then that a major limitation of the system became known: since the Aadhaar Act, 2016, the UIDAI alone is authorised to lodge a complaint when a data breach occurs. This prevents the people whose data have been breached to lodge a complaint by themselves. Worse, this State agency is not legally obliged to inform an individual her/his data are defective, have been leaked or used by a third party. Each time this monopoly was challenged, for example, through Right to Information (RTI), the petitioners were dismissed in the name of "national security," which confers inordinate privilege on the UIDAI.[51] While the UIDAI itself sued several private companies, including Axis Bank, for the reason mentioned above, it has almost never attacked the State despite the lapses described above.[52] The Food and Civil Supplies Department of the Union Territory of Chandigarh had published the Aadhaar data of 490,000 PDS beneficiaries. The state of Jharkhand did the same with that of 150,000 government pensioners. The ministry of Rural Development published the Aadhaar details of 100 million NREGA beneficiaries online. In all, 210 websites linked to public authorities were the source of major leaks.[53]

Nevertheless, the State expended more energy in covering up the problems than tracking the guilty. The whistle-blowers were, in fact, among its first victims, one of them being arrested for having revealed vulnerabilities in the system.[54] The same kind of pressure was exerted on

the media. When the Punjab-based newspaper *The Tribune* carried an expose on anonymous sellers over WhatsApp providing full access to the details of the over 1 billion Aadhaar numbers generated until then, the UIDAI filed a case against the reporter behind the investigation, forcing the Editors' Guild of India to take up cudgels on her behalf.[55]

Finally, IT experts point to the weakness induced by a centralised data depository, the CIDR. According to some of them, the question is not *if* but *when* it will be breached, because the high stakes involved would justify mobilising vast resources, similar to the hacking of credit card details from e-commerce websites, or identity theft from dating sites, which are behind several scandals in the West. Hence, according to some of them, decentralised storage, on personal cards, for instance, or even the use of modifiable passwords rather than intangible biometrics, would have been preferable.

A micro-political question: how can one get people to enrol?

For the Aadhaar project to succeed, it was indispensable to enrol all Indians. If, for any reason, too few people had enrolled, companies would not have used the unique number, nor would administrations. Both of these would want to reach sufficient numbers of clients/residents. The State, in turn, would not have been encouraged to invest in the endeavour to enrol people. The promoters of the project needed to find ways to swiftly kick off a virtuous circle.[56]

The first methods employed, borrowed from marketing, were incentivising. In 2009, the agency opened its Demand Generation and Marketing division, headed by Shankar Maruwada. An alumnus of IIT Kharagpur (1994) and IIM Ahmedabad (1996), Maruwada had earlier served in brand management at Proctor & Gamble from 1996 to 2000. He went on to found his own firm in Bengaluru, Marketics, which he headed from 2003 to 2008. UIDAI needed to create a sense of need among the people for having an Aadhaar. A common work tool for this are focus groups: a moderator presents an idea to a gathering and observes the discussions, the reactions that it elicits, and adjusts the message to eliminate offending arguments and highlights what hits the bullseye, as done in an ad campaign.

A preliminary outcome of this work in terms of brand image was the transformation of the "UID Project" into "Aadhaar." Its success must be acknowledged, as it is under this valorising

and "Indian" tagline that the project would henceforth be known, not only in India, but also all over the world. The homepage of the agency's website would proclaim thereafter, "*Mera Aadhaar, Meri Pehchaan*" (my foundation, my identification), bearing a very positive connotation for an individual's adhesion to the new system. Credit for this discovery is also due to Naman Puglia, a young member of the team organising focus groups with tribals in the rural areas of Rajasthan.[57] At the end of a session, an old man approached him and expressed support for the project, asserting, "*Pehchaan hi toh jeevan ka aadhaar hai*" (identity is the entire foundation of life).

Registrars, in turn, set up mechanisms that would be incentives for enrolment. The ministry of External Affairs, for example, issued passports in record time to citizens who furnished their UID number.[58] Public-sector banks as well as private ones pushed their clients to "link" their bank accounts with their UID numbers, sometimes threatening to freeze their accounts if they did not comply.

Vulnerable sections of society were a priority target, given that an Aadhaar card could be regarded as guarantee of one's existence in the eyes of the State, or even as a sign of social recognition. This was often so in the case of Muslims in a period during which they were frequently targeted by the Hindu nationalist power.[59] As explained by Irfan Engineer, head of an NGO promoting secularism:

[Engineer:] Muslims were very enthusiastic to have Aadhaar in the first place and that's because they're more insecure. Many social activists boycotted taking up Aadhaar. I, however, did not have that luxury, I needed an identity document and if I did not have any, I would be under more suspicion [than the average Indian] (...) because of my [Muslim] name.

[Authors:] But this sense of insecurity is more acute in Muslims?

[Engineer:] Yes, it is (...). They were made insecure all the time, their nationality was questioned all the time, and were told to go to Pakistan. They weren't allowed full freedom for their cultural practices. For example, if you're consuming non-veg food then you're advised to go to Pakistan. I've heard it all the time. Aadhaar was seen to partly allay some fears and insecurities and the State was recognising and accepting you as its citizen.[60]

This opinion, as will be seen, has changed.

However, apart from incentives and the marketing push, people also enrolled because, despite the fact that it remained unclear for a long time whether it was optional or mandatory to have this number to access a series of common services, it became *de facto* mandatory to deal with public authorities on many occasions. One of the first steps towards this came through messages from client relations officers or street-level bureaucrats[61] who would refuse to grant or delay a requested service without an Aadhaar. The case of Muhammad, who found himself in such a predicament, is illustrative.[62] This under-30 lawyer was supposed to close a bank account of a recently deceased family member. The bank employee asked him for his own UID number, which he refused to give. The matter dragged on for a long time until one day at the bank, chancing upon his file, he learnt that special checks had been carried out on him without his knowledge, revealing nothing suspicious about him. Furious about such suspicion, which he attributed to his religion, and wishing to see an end to the long-pending matter, he finally gave his Aadhaar number. The bank account was soon closed thereafter.

If the middle class faces problems in buying goods (cars, for instance) and services (efficient banking services, telephone connection, etc.) without their Aadhaar number, those from the working class often face refusal for essentials, such as healthcare (the well-heeled see doctors at their private chambers or private hospitals and clinics), as illustrated in Munni's case.[63] On 9 February 2018, this young villager turned up at a Gurgaon hospital as she was in labour. Since she was unable to produce an Aadhaar card, the hospital refused to admit her, and she ended up giving birth to her baby in a nearby parking lot. The hospital subsequently suspended a nurse and a doctor. A week after the delivery, Munni returned to her village to collect her card, and the parents resolved to apply for an Aadhaar card for their little girl so that she would not have to go through such an ordeal.

Muhammad and Munni's cases show that, even if possessing an Aadhaar number is not mandatory, it at least serves to facilitate matters: the temporary denial of service from the person in charge of providing it—as illegal as it may be—has a powerful impact on motivating people to apply for enrolment.

An additional degree of pressure came when possessing an Aadhaar number became a legal obligation. In March 2017, the government required school-goers to have an Aadhar number to be able to avail of midday meals at school. This measure certainly led many parents to enrol their children. Some opponents asked: "Why is the government so bent on registering children on the Aadhaar database, to the extent of jeopardising one of its most important food programmes?" Child malnutrition continues to be a major challenge for India, and the midday meals scheme is vital for addressing it, while also encouraging the education of children who would otherwise might get pushed into child labour.

In the meantime, a major legal battle had started on this issue between the central government and the Supreme Court. On 23 September 2013 and five other occasions till October 2015, following many cases of social welfare services being denied, the Supreme Court passed interim orders stating that: "No person should suffer for not getting the Aadhaar card" in spite of the fact that some authority had issued a circular making it mandatory. However, in practice, the State continued to demand this number to provide social welfare services. Finally, in September 2018, in a long awaited judgement, the Court decided in a spectacular *volte-face* that enrolment would be mandatory to avail of certain social rights, and be optional for commercial services (an aspect dealt with in the last part of this working paper).

The practical necessity of an Aadhaar number to access a series of services considerably boosted enrolment. The project benefited from the power of big companies and the State's capacity to exert pressure. No Aadhaar, no services or rights, which led to a vigorous rise in enrolment to the extent that in November 2018, the UIDAI announced that 1.2 billion persons were registered, i.e., around 92 percent of the population.[64]

Overcoming opposition

While they proceeded to the enrolment of people, the main target of the project, its promoters had to protect it from its opponents.

Bypassing Parliament

The Parliament took special interest in Aadhaar, a project that could lead to a fundamental reorganisation of public action and have far-reaching consequences on the lives of Indians.

Nandan Nilekani had foreseen that action would be necessary on this front. During his meeting with Prime Minister Manmohan Singh in 2009 he had asked for a law to be passed swiftly to protect the organisation. A Bill was tabled in autumn 2010 in the Rajya Sabha, the upper chamber of the Indian Parliament.[65] Its chapter headings are eloquent. After the usual preliminary (Chapter I), the first substantial chapter (Chapter II) focuses on "Aadhaar Numbers," which confirms that the identifiers are the *raison d'être* of the system, rather than their applications, or the rights that they would help assert. In fact, it specifies, probably in line with Pranab Mukherjee's aforementioned arbitration before the establishment of the UIDAI, that the numbers are allocated to residents and would not be a proof of citizenship, or anything else whatsoever, apart from their identity. Their use matches what UIDAI does: allocation of a number for biometrics and a yes or no answer to a request for authentication. Article 9 deals with data collected besides biometrics. It does not give a fixed list of these, but only states what the UIDAI may not collect: race, religion, caste, tribe, ethnicity, language, income, and health. In other words, apart from these elements of information, the UIDAI has carte blanche to collect what data may be stored in the CIDR. Moreover, these precautions, which perhaps had to do with ensuring interoperability, were of no use for protecting personal data, because the national identifier is shared with other databases that let various information to be crossed. The Bill was completely silent on this point. Finally, the last article was a retroactive legislative approval for all that the UIDAI had done on the basis of a simple authorisation from the administrative authority.

Stormy debates ensued in Parliament. In December 2011, the Parliamentary Standing Committee on Finance, dominated by members of the Lok Sabha (the Lower House), chaired by Yashwant Sinha (Member of Parliament [MP], BJP), rejected the Bill. The Bill was, in fact, in violation of Parliamentary rights, as, on the one hand, the UIDAI had started functioning without the authorisation of this democratic organ (which votes the State budget) for its spending, and on the other, as the Bill, by having listed a non-exhaustive number of matters excluded from the ambit of the agency, would allow the extension of these without parliamentary oversight. The Committee recalled that the United Kingdom had abandoned its own biometric identification project and took up the arguments of the London School of Economics on this matter: unsecure technology, uncertain returns, and potentially conflictual relations between State and society.[66] The Committee also stated that the Aadhaar numbers

had nothing to do with problems of distributing social welfare aids; that the UIDAI was duplicating the work of the NPR; and asked for amendments to the Bill in the light of its remarks.

The legislative process remained stalled for several years. The 2014 General Elections gave a majority to the BJP. The new Prime minister of India, Narendra Modi, who had until then been very critical of Aadhaar, dismissing it as a gimmick during his campaign,[67] became a convert of the system, apparently following decisive discussions with R.S. Sharma and Nandan Nilekani.[68] Thenceforth, the executive wing promoted Aadhaar systematically. His resolve translated into coming into force of The Aadhaar (Targeted Delivery of Financial and Other Subsidies, Benefits and Services) Act, 2016. The full name of the Act highlighted its purpose of extending social welfare and benefits to its users, something that was far from a correct picture of the whole project. The government passed it in Parliament as a Money Bill, the only type of legislative text that does not require voting by the Upper House, where the BJP did not have a majority. It amounted to an abuse of power as the Aadhaar Act includes a number of non-financial aspects. The structure of this Act also generally reproduces the 2010 text. It is just more detailed due to the experience accumulated over the six years that had elapsed since the first Aadhaar Bill. Above all, it authorised the sharing of the Aadhaar-holders' number, photo and demographic data for KYC purposes, something that was not done at the beginning when the UIDAI was only supposed to respond with a "yes" or "no" to the authentication query. This, according to Jean Drèze, is a "foundational" change—a heavily loaded pun.[69] With the 2016 Aadhaar Act, the UIDAI gained full legislative approval of its past and future actions.

Bypassing the judiciary

Apart from the Parliament, the Bill also came up against the courts. Particularly during a petition on the unconstitutionality of the Bill voted into law: after the Aadhaar Act vote, the opposition did not fail to initiate proceedings in the Supreme Court on this matter, reviving the argument of the lack of initial authorisation from the Parliament (the first argument of the Yashwant Sinha committee), along with that of breaching the provisions of a Money Bill.

Numerous petitions had already been filed against the project.[70] In end-2012, when it was still deadlocked in Parliament, K.S. Puttaswamy, a retired judge of the Karnataka High Court, and

P. Khanna, a lawyer, filed a writ petition in the Supreme Court on the grounds that the collection of biometric data could potentially violate the right to privacy and could therefore only be authorised by Parliament, under Article 21 of the Constitution; they also stated that the Aadhaar number would enable illegal migrants to obtain rights. Over time, more petitioners joined them and raised many arguments. However, beyond the clash over whether Aadhaar was optional or mandatory to access various services and the issue of the illegality of the UIDAI—to which the government replied that the agency had been established through an executive order of the government and was therefore perfectly legal—the main opposition focused on the violation of privacy.

The Supreme Court was not in a hurry to hear all the petitions, given the government's determination to push the Bill. It even decided to group up Aadhaar petitions instead of hearing them as and when they were filed. Thus, three years elapsed between the first petition filed in 2012 and its first response in August 2015. The Supreme Court convened in a small bench for a final ruling on the constitutionality of Aadhaar. Astonishingly, the Attorney General for India (who represents the State), raised a preliminary objection, contending that the right to privacy was not a constitutional right. The court then decided to refer this issue to a larger bench, once again recalling that Aadhaar was optional, not mandatory, limiting its use to the PDS and LPG cylinders—an area that it expanded in October to include other social welfare schemes and Telecom companies, following the review petitions of major players from the sector. Thereafter, another two years went by before the Court ruled on privacy in August 2017.[71] Contradicting the government, it declared the right to privacy as a fundamental right protected under the Indian Constitution. However, the Court also declared it to be circumscribed: "Privacy is not absolute and cannot prevent the State from making laws imposing reasonable restrictions." It was an appeal to the State to legislate anew on Aadhaar. The UIDAI, in the meantime, continued its enrolment drive. As journalist S. Sharma said, slightly exaggerating the figures, "What happened was by the time the Supreme Court judgement came, 99 percent of the population already had Aadhaar."[72]

Finally, on 26 September 2018, a nine-judge bench of the Supreme Court finally delivered its much-awaited, lengthy verdict of 1448 pages. All the judges, except one dissenting voice, in a text that was but one-third of the ruling, and in a spectacular *volte-face* with regard to the

decisions reiterated since 2013, rendered Aadhaar mandatory for social welfare programmes financed from the Consolidated Fund of India, and maintained that it was mandatory for paying income tax. The latter was an initiative taken by the Finance ministry in 2017, which saw online payment disabled for those not entering their Aadhaar number at the end of their declaration of income. On the other hand, the Supreme Court confirmed that Aadhaar was optional for commercial services, such as banks and telecom (Article 57 of the Aadhaar Act), as well as other public uses: pension and school admission. The lone dissenting judge accepted almost all the arguments of the petitioners in a very detailed opinion (making up two-thirds of the decision), declaring that Aadhaar could not be mandatory for anything at all.

The government bypassed the hurdle of excluding commercial services by an ordinance amending two laws: the Prevention of Money Laundering Act, 2002, and the Indian Telegraph Act, 1885, in such a manner as to make it possible to send data from the Aadhaar database to banking authorities and telephone operators. Ultimately, the State's driving determination seems to have overruled the reservations of the Supreme Court, which was ambiguous and quite unhurried in its ruling on this case. Between September 2013 and October 2015, it passed six interim orders reaffirming that Aadhaar was voluntary. The government did not submit to these decisions, and the Supreme Court, in the face of this *fait accompli*, took note—some of the judges convinced of the validity of the project, others preferring not to clash with the government. In the end, only a small minority remained to continue the fight.

Later interviewed on this sequence of events, Supreme Court lawyer, Karuna Nundy, very clearly stated that:

> A lot of the critique of the Supreme Court in the context of Aadhar (...) is that either it is unable or unwilling to act in time. So (...) you have a Government policy that (...) is sometimes contrary to interim orders (…) in the case of Aadhar, it was in contempt and in violation of the court's orders. In theory, people should go to jail for that. This will not happen and instead Government said that, well, we have done it now and we spent a lot of money and most people have it so it is working fine, we might as well keep it. The Supreme Court then says okay, we will not make it compulsory for XYZ but we will make it compulsory for, say, income tax filings.

Following the Supreme Court's 2017 verdict on right to privacy, the State formed a committee chaired by (another) retired judge, Bellur Narayanaswamy Srikrishna, to deliberate on a law for protecting privacy. In July 2018, the Justice Srikrishna Commission published its report and the Personal Data Protection Bill (PDPB) was tabled in the Parliament. These documents echoed the argument of the government and technophiles who opined that the right to privacy was not an absolute right, and the eventual violations to it must balance the apparent conflict between civil-political rights of some individuals versus the socio-economic rights of others.[73] Europe's General Data Protection Regulation inspires this text, without it being as stringent.[74] At the time of writing this working paper, the Bill was yet to be voted. Such a protracted process for creating rights, in addition to the Supreme Court's unconcern, stands in contrast to the swift deployment of UID. It would thus appear that the drivers of the project bypassed the obstacle of the Court. First, they ignored its judgements, which stated that the UID was optional, as it would have hampered its spread among the people. Next, they obtained the postponement of its final verdict in exchange for a solemn affirmation on the right to privacy, which is itself circumscribed. Then they renounced the obligation to use the UID number only for a limited range of services (which could in any case be denied in practice if the client did not cooperate, following the model of "mentors" like Google or Facebook). Lastly, they kept the UID mandatory for essential functions, such as social welfare programmes for those whose lives depend on it, and income tax for the middle class.

The result

A long-term investment for firms involved in the project

One of the first outcomes observed after implementing Aadhaar was the rise in the volume of transactions of the firms using it. This stemmed from a fall in client-acquisition costs, which was largely facilitated by two innovations linked to Aadhaar: eKYC and UPI, described earlier. Thus, the reduction of transaction and administrative costs for firms tops ID4D's assessment of the economic impact of identification systems at the global level, precisely by offering the Aadhaar example: "In India, for example, the typical firm's onboarding cost has been about 1,500 rupees ($23). With the increased query-ability, digitization, and interoperability of the Aadhaar system, some estimate that onboarding costs could plummet to as little as 10 rupees ($0.15)."[75]

Other benefits identified by the international agency are the reduction of costs related to legal obligations (combating money laundering) as well as the companies' liability in case of their database being hacked (as external identification systems host the personal data); easier customer prospection; lesser customer identification errors producing "false positives" (low-risk customers falsely assigned a high-risk score); and providing biometric identification services for firms working in this sector.

Venkatesh Hariharan, Director of IDFC Institute, the research organisation of the eponymous bank, highlighted these positive points in India:

> It [the cost] is very high to verify these things [paper IDs], it is easy for me to photoshop something and give it to the bank. This also brings in the financial inclusion angle, because if my transaction cost is high [for the bank that has to verify these ID documents] then that really affects the kinds of loans I offer. Therefore, one of the key things about Aadhaar from a financial point of view is that it brings down the transaction cost. So, if a bank must have spent 100-200 rupees doing authentication, with Aadhaar they can bring it down to 10-15 rupees. (…) [On the other hand], when the frauds go up, instead of pricing your loans low, you start pricing them higher. It has a ripple effect. Aadhaar brought down the frauds [and therefore allowed lower prices for loans].[76]

Hence, by decreasing the cost banks incurred in the authentication of potential borrowers and bringing down fraud, Aadhaar helped reduce borrowing costs and thus fostered financial inclusion.

Changes in retail payment systems well illustrate the spike in volumes that Aadhaar brought about. UPI saw swift growth with USD 359 million in March 2017 (see Table 1). On this occasion, demonetisation (November 2016) probably played a major incentivising role in this rise, even if it originated from a far more political motive. Among the companies that use UPI are WhatsApp and Paytm, an Indian pioneer of online payment. Its founder, Vijay Shekhar Sharma, apparently started out offering this e-payment wallet for buying bus tickets, before widening its scope, and Paytm saw its customers soar from 22 million in 2014 to 215 million in 2017.

Table 1: Payments transiting through the Aadhaar-based (UPI or Universal Payment Interface)

	08/2016	09/2016	10/2016	11/2016	12/2016	01/2017	02/2017	03/2017
Monthly amount (USD million)	0	5	7	15	108	249	285	359
In (%) of all digital wallets	0	1	1	3	9	21	25	30

Source: Mary Meeker, "Internet trends 2017" (Annual Code Conference, Terranea Resort, California, US, 31 May 2017); https://www.vox.com/2017/5/31/15693686/mary-meeker-kleiner-perkins-kpcb-slides-internet-trends-code-2017.

However, high volumes do not necessarily mean high profit margins. In fact, although UPI showed a spectacular rise in volume and values it processed, the profits were disappointing.[77] True, the total volume of transactions UPI claimed were around 1.3 billion in December 2019, i.e., close to 40 percent of the 3.3 billion transactions recorded by national retail payment systems. Its value was INR 2,025 billion (around USD 28 billion; this figure is consistent with the value of USD 359 million in March 2017 as shown in the Table 1). However, this value accounts for only 6 percent of the INR 33,284 billion from all the payments systems taken together. A major part is made of other types of inter-bank credit transfers (73 percent), paper-based instruments (19 percent), card payments (4 percent), and so on. Thus, if we assume that the tariffs are overall proportional to the sums exchanged, the profits from UPI—and therefore authorised by Aadhaar—remained limited in comparison to those gained from traditional retail payment instruments.

This situation of high transaction volume and limited profits is due to the Aadhaar-related business strategy, namely, a long-term investment in collection and analysis of data. In the case of Paytm, which typically combines customer identification through Aadhaar, high volumes and unassured profit, the principle of this strategy is explained thus:

[a] The most important metric to measure is the number of users in the platform. That means, 1000 less active users are better than 100 active users. Because less active users can also bring data with them. [b] Deploy every trick in the book to get people to transact. It is better to have 100 users conduct some form of micro transaction as opposed to 10 users who may choose to spend large sums of money. The more the people transact, the more insight you gain into what is on their mind. Data matters.[78]

Investment in data collection carried out by firms thanks to Aadhaar would therefore be profitable in the longer term due to one main factor: reselling (and/or direct monetisation) to loan brokers and organisations data collected along the entire chain of the sector, and even selling "solutions" to individuals for protecting the data thus collected. India would thus join the global personal data economy.

Do States really make budgetary savings?

As far as State administrations are concerned, apart from an enhanced surveillance of people—which will be dealt with later—one of the main results of Aadhaar would, in principle, be budgetary savings. However, this is doubtful, as several controversies that have pitted the defenders against the opponents illustrate.

The most prominent one was triggered following the World Bank report on digital dividends, in which India is frequently cited as an example.[79] The level of cost reductions credited to Aadhaar in the report was considerable: USD 11 billion per year. The figure was mentioned in an annexure[80] on the specific contributions of individual identifiers to the digital economy. The Bank cited a study according to which India's fuel subsidy programme, by implementing cash transfers to Aadhaar-linked bank accounts for LPG cylinders, saved about USD 1 billion per year.

This preliminary estimate itself is disputed. It was extrapolated from a chapter of a thesis defended at the University of Columbia[81] based on data from Hindustan Petroleum, an oil and gas major, and a black-market survey. The figure advanced was itself doubled (USD 2 billion per year) in an article by the Chief Economic Adviser to the Indian Government published in *New York Times*.[82] However, following the publication of a number of critical articles in the

press, the authors retracted partially, explaining that the figures presented were not actual but potential savings, the only reliable element being the decrease in subsidised gas consumption.[83]

The second point of contention was the extrapolation of the conclusions on LPG to all Aadhaar-linked programmes. On this, the World Bank wrote: "This is just one of many subsidy programs in India that are being converted to direct transfers using digital ID, potentially saving over USD 11 billion per year in government expenditures through reduced leakage and efficiency gains."[84] It justified this claim with a footnote, which sparked off heated debates. Its initial version referred to a CGAP brief authored by Shweta Banerjee.[85]

While this study dealt with Direct Benefit Transfer (DBT), i.e., the direct transfer of subsidy to the account of an Aadhaar-verified beneficiary (the traditional subsidy being in kind, such as gas or food grains at subsidised rates), the USD 11 billion annual figure she had advanced did not reflect the savings that could be made through DBT, but the total amount for Indian programmes that might use this technique.[86] Contacted on this matter by an investigative journalist,[87] the World Bank finally replied that the USD 11 billion of savings did not come from Banerjee's study, but from an extrapolation of two estimates to all the programmes. First, the percentage of savings made by usage of Aadhaar for the LPG programme calculated in the Columbia University thesis, which stood between 11 and 14 percent. Second, calculated from savings from the National Rural Employment Guarantee (NREG, the scheme instituted in 2005 by the NREGA mentioned earlier) through the introduction of another biometric ID (smart card), pegged at 10.8 percent.[88] The savings range was between eight and 14 billion, and the World Bank with due rigour (*sic*) apparently reported the midpoint, i.e., 11 billion. This official reply replaced the initial footnote in a new version of this Bank report, which is what we now find online. The extrapolation from the two cited articles was not straightforward, and the substitution of proof is, for the least, troubling. When re-contacted by the same journalist on these two points, the Bank had no other response to proffer. This silence is all the more awkward as the assessments on LPG subsidies were themselves questioned soon after the Comptroller and Auditor General of India published a report stating that 92 percent of the price fall came from the fall in barrel prices and 8 percent from the demand for subsidised gas.[89] Therefore, the actual impact of Aadhaar would apply only to

LPG and to less than one-tenths of the original estimate on this product. Overall, while information is available erratically, there is still no clear estimate of the savings Aadhaar may have brought about for the public authorities.

For the people: gains in efficiency, denial of social protection rights, and endangerment

Gains in efficiency

For the promoters of the UID, making a paperless choice, which led them to adopt biometric data and replace the ID card with a simple number corresponding with the said data, has proved to be worthwhile. Rajesh Bansal, a high-ranking official of the Reserve Bank of India (RBI) who worked in UIDAI just after it was founded, explains that this is the best strategy for a country regularly hit by natural disasters: "it is the best way to preserve your access to services even if there is a flood and you lose everything, including your ID...." [90]

Apart from these, Aadhaar eases the life of many Indians who, thanks to its applications, can now carry out administrative procedures without needing to step out of their house, queue up at a counter, or grease an official's palm. Venkatesh Hariharan gives a concrete testimony of the time and money saved as the proprietor of a rented-out property. He described the signing of a Rent Agreement:

> [For such a procedure], typically one spends half a day going to the registrar's office in dingy space and you need to pay some money otherwise they keep you waiting endlessly. You end up paying 5000 rupees apart from the regular fees. [What has changed with Aadhaar] is that we ended up calling this company called Easy Rent, they came to my house took my fingerprints and the tenants' fingerprints, did the Aadhaar authentication and the whole thing was done in an hour. They charged 1000 rupees additionally, but I saved 4000 rupees and half a day.[91]

Other applications using Aadhaar also translate into similar gain in efficiency and cutting out intermediaries—a sign of progress in reducing corrupt practices. On his mobile phone, Charles Assisi showed us *Digilocker* (the paperless layer of India Stack), where he stores his official documents, such as his driving licence, which is accepted by the police, and which does away with the risk of loss as it is saved online.[92]

But the flip side of these gains in efficiency is also significant. The system suffers from internal contradictions that impede it from attaining and maintaining a coverage rate of 100 percent: if 92 percent of Indians are officially enrolled, this achievement is today being questioned. According to Paul W.: "There are many typos in the names. (…) [And the] big issue today is updating data. There is a bottleneck. There aren't enough [enrolment] centres, bandwidth, or resources to update the data."[93]

On top of that, the Indian population is increasing by 16 million persons annually and many Indians change their address, phone number, rendering the database partially outdated for companies that wish to know their customer through it (the famous eKYC). One of the project's promoters, Rajesh Bansal, affirms this serious limitation that Aadhaar is facing today: "The issues about updation and lost ID are not being solved proactively and to the desired extent. I am sad about that because that is critical. There are too many people who change their mobile number, addresses and even names." [94]

Denial of social protection rights

If the Aadhaar leakages and fraud are problematic from a general point of view, another criticism is the system's lack of reliability when it results in the denial of social rights, especially when the poor that the system is supposed to help in receiving State aid are themselves deprived of the same.

Whereas fighting corruption in social protection programmes was the main raison d'être of Aadhaar according to its champions, some of them today admit that this goal has not been attained—and probably never will. Asked whether Aadhaar had brought down corruption, one of them laughed: "I wish… The moment you plug in one hole, the other one opens up. I don't think technology can solve the intent problem." Rajesh Bansal elaborates in the same vein: "There are various ways of gaming, firstly you can say that the system is not working [due to the internet connection being down, for instance], simple. (…) You really cannot stop it [this kind of behaviour] completely because people will be people …." These admissions of impotence from influential promoters of Aadhaar deserve particular attention because they bolster Evgeny Morozov's criticism of "technological solutionism"[95]: digital technology

cannot—any more than others can—resolve problems of corruption as long as people have an interest in being so. But what are the practices that are being referred to? Various researchers in their fieldworks have found mainly three types of fraud in the Aadhaar scheme with regard to social welfare aids. [96]

The first is that of *eligibility*, i.e., people faking eligibility for social welfare aid: for example, underreporting income so as to appear being under the poverty line. The second fraud is that of *quantity*, which is mostly seen in PDS shops (where, it may be recalled, the poor buy their foodstuff) and under the NREGA scheme. In the first case, the ration shop owner records a fake transaction by pretending to the cardholder that the internet connection has failed (and keeps all the products—that he pretends to have given officially—for himself), or giving the rightful beneficiary a lower quantity than officially declared.[97] He then keeps the difference, reselling it at market price if the opportunity arises. As Reetika Khera writes: "If a person authenticates monthly grains with a thumb print, it does not really mean that they have received the full promised quantity of grains; the digital trace might show they have received in full but that might not necessarily be the case in reality." [98] In the case of NREG, the fraud perpetrated by a local authority could be: (*a*) extort a labourer's wages in full or part on their payday; (*b*) oblige the labourer to share their wages after having artificially inflated the number of workdays; or (*c*) using the labourer's Aadhaar number without consent (and without using their biometric data, as this is possible. See below).[99] Lastly, *identity theft*, i.e., creating the famous "ghosts" or "duplicates," elimination of which was the justification for Aadhaar in the first place. Indeed, the original idea was to exclude all those who use a fake identity to abuse the aid system meant for the poor. As Reetika Khera explains, intermediaries can "manufacture the existence of a non-existent person and use [this] card for benefits." Similarly, "if a beneficiary dies, the dealer still continues to receive the grains" if they continue to use the Aadhaar identifiers of the beneficiary (which they would have stolen beforehand). This is precisely the kind of fraud that Aadhaar can help remedy. However, the unique identifier can do nothing about the other two kinds of fraud, eligibility and quantity, which, quantitatively speaking, are far higher.

Moreover, fraud is but one aspect of the poor's problem of access to social welfare rights, because far from simplifying their life, Aadhaar sometimes becomes yet another hurdle for

these potential beneficiaries. Imposing Aadhaar as a mandatory condition can even lead to their exclusion. Several scenarios need to be outlined.

First, *exclusion for non-linkage of Aadhaar* to a social aid scheme for which an individual is already registered. For example, X receives aid (food rations, pension, etc.). They might have been considered a statutory beneficiary, for example, by a retirement fund, but following the introduction of Aadhaar, they would now need to link their Aadhaar number to the organisations that send them a subsidy in their bank accounts. However, the process of linking these is not always a simple matter: sometimes there is a technical problem (electricity supply, internet connection, biometric identification, typo errors, and so on) and sometimes the official in charge is corrupt. Reetika Khera also points out that some missed enrolling due to cut-off dates for enrolment about which potential beneficiaries were not necessarily informed.

> There is a problem with linking Aadhar numbers. This is not a trivial problem for poor people as they need information about deadlines for linking and they only get information when their benefits stop coming—and the Government will do nothing to facilitate them and so they have to go by themselves to these private setups. People have to pay money to do the linking even though it is not supposed to be charged.

Worse still, the link between a person and their social benefit can be the target of misappropriation by private players who exploit the mine of information offered by the Aadhaar details of potential customers. Thus, when linking SIM cards with Aadhaar became mandatory on 31 March 2018, Airtel, one of India's three telecom majors, exploited this to open Airtel Payments Bank accounts for their customers without their consent while performing Aadhaar e-KYC verification—the risk stated being public subsidies siphoned off instead of being credited to their real beneficiaries.[100]

Second, *exclusion for lack of identification*, which may happen after being linked, when the beneficiary does not receive their due because of a problem occurring during the authentication process. Once again, this could be due to a technical lapse (low bandwidth or power outage) or a biometric issue (unreadable fingerprints or iris scans). These are frequently occurring difficulties arising from the low-grade equipment used—and not only in

remote villages (even though the risks are higher there). In Delhi, 33,000 persons could not receive their pensions owing to Aadhaar-related problems, ranging from ABBA false negatives owing to the poor quality of their fingerprints, to their bank accounts not being linked to Aadhaar.[101] It was following this affair that the Delhi government decided that the UID number would not be mandatory anymore for pension payouts. However, the Supreme Court ruled otherwise in 2018. Aadhaar complicated access to monthly food rations with a particular requirement: the beneficiary would have to be identified biometrically every time they could claim it, i.e., once a month. Reetika Khera points out:

> This is not considering that every month the internet has to work perfectly and there is no room for technical glitches in servers or biometric matching because even that is a probabilistic science. All this for something that you could earlier get just by signing the register.[102]

Lastly, comes *exclusion through a person's inability to be physically present* at the ration shop where the biometric verification takes place. This requirement can exclude the ailing (particularly if they are contagious) or those with reduced mobility (due to disability or age). Having realised this obstacle, the architects of Aadhaar sought to resolve it. Rajesh Bansal admitted:

> You have to go there yourself and so that is a challenge. In Andhra Pradesh, the state government took care of old age pensioners who were immobile and said they will send the agent home. This is proactive governance unlike some other states which only issued orders to implement Aadhaar without even bothering about a basic thing like connectivity.

In practice, even if people excluded from Aadhaar account for only 5 percent of the total, as R.S. Sharma had confirmed, this means that the system lacks universal coverage, since there is no guarantee of a degraded mode being used.

Coming back to the two sides of this major challenge: the statistics and impacts of exclusion. Regarding the figures, certain studies suggest the risk of exclusion concerns more than 5 percent potential beneficiaries. A study in 2017 assessed that 58.6 percent of people eligible for PDS were excluded on some ground or the other.[103] In Rajasthan, a high-ranked

bureaucrat estimated during the same time that the machines used could only authenticate 45 percent of eligible persons.[104]

In certain cases, this eviction effect inherent to the Aadhaar technology had drastic consequences. Five people who could not surmount this obstacle—and to whose aid the local PDS operators did not come—died of hunger. The government then decided that it would no longer be necessary for beneficiaries to be authenticated to get their food rations, but for quite a few regions, identification continued to be the rule.[105] In Rajasthan, people continued "facing hunger and starvation."[106] In Karnataka, three people died of hunger in the same circumstances as in Jharkhand.[107] From October 2017 to September 2018, at least 20 people were reported to have died of hunger due to pensions or food rations being stopped for not being linked to Aadhaar, and five more if one counts from January 2017.[108] In all, the number of system-induced deaths is evaluated at 44, of which 23 were in Jharkhand, where all those who died due to Aadhaar were either Dalit (formerly referred to as the untouchables) or tribal.[109] The most emblematic case of the tragedy was that of Santoshi Kumari, an 11-year-old Dalit girl in Jharkhand, who died of starvation in September 2017 because her family had not received rations from the local PDS shop for six months, on account of their ration card not being linked to Aadhaar.[110] The UIDAI said it had issued a circular for setting up a mechanism for exemption in such cases, but whether it was actually applied is not known.

Given these hurdles, Andhra Pradesh, started also accepting an Aadhaar card offline, allowing its holder to avail of their rights to social protection schemes without biometric authentication. Other union territories and states followed, beginning with Puducherry and Chhattisgarh. However, the central government remained unmoved, deciding that if the numbers in social protection programmes had fallen, it was due to duplicates—for which they finally had proof. Wasn't bringing savings to the State one of Aadhaar's goals?

The case of Rajasthan is one of the most revealing here.[111] The Rajasthan government, which had created its own database from Aadhaar, Bhamashah, reported a savings of INR 6 billion thanks to the scheme, namely by deleting lists of 297,000 "dead" and 170,000 "duplicates." Several problems arose. First, the government transferred the payments from local post offices to banks. However, many beneficiaries did not have accounts in these banks, or their

fingerprints did not allow them to enrol, or were enrolled with mistakes in domiciliation or age. Others faced the consequences of errors made by E-Mitra, a private local e-governance service provider tasked with linking beneficiaries' details with their Aadhaar numbers online. Another service provider was reported to have made mistakes with ration card particulars. As a result, a beneficiary without a bank account linked or "seeded" with Aadhaar and the correct information was declared dead. Sometimes the Aadhaar number was seeded with the bank account of another person, who received his or her pension instead. After six months, numerous transfers made to bank accounts remained uncollected. When the Rajasthan Finance department realised this, it ordered physical verification of beneficiaries, which was carried out more or less scrupulously, resulting in more deletions from the lists. The journalist who had investigated the case reported that at a panchayat she had visited, out of the 44 persons officially recorded as being dead, 25 were actually alive. Other journalists have estimated that at the state level, around one-third of the "dead" were, in fact, alive. Their meagre pensions were between INR 500 and 750 per month, which is low but an indispensable source of provisions for the beneficiaries. Some indeed died in the months after their pensions stopped. Villagers protested at panchayats and the Mazdoor Kisan Shakti Sangathan (MKSS), an NGO headed by Nikhil Dey, relayed their collective action, which raised awareness about this problem. However, the Rajasthan government transferred very little money in terms of arrears to the beneficiaries.

While they acknowledge the existence of problems, the architects of Aadhaar do not plan a rollback. On the one hand, R.S. Sharma thinks that there is no perfect system and thus Aadhaar is all the more a significant progress: "Previously you could game the system 100 percent of the time and now we have managed to clean 95 percent of the cases. Also, in no public policy can you have 100 percent cleaning record. Exceptions will always be there." On the other hand, R. Bansal not only minimizes the human cost of Aadhaar, but also exonerates the UIDAI by recalling the exemption procedures that the authorities have always recommended: "In Jharkhand there have been a couple of deaths reported which is completely unacceptable so (...) the Aadhaar team has always said in writing and orally that we have to build an exception mechanism for failure of biometrics." It would appear that as of date, the UIDAI is yet to conduct any internal inquiry on the application of these exemption procedures on the ground.

Economic and political endangerment

Aadhaar jeopardises the confidentiality of the personal data of those who have enrolled, not only through the leaks mentioned earlier, but also due to the interlinking of files. Once a customer's number is obtained, there is nothing to stop any operator from collating the other available information on her/him, nor from circulating it among other databases, probably against a fee.

Thus, little by little, Aadhaar was linked to a series of files: those of social welfare programmes (NREGS; Direct Benefit Transfer of LPG Scheme; and PDS, to mention but a few); taxation (as it is not possible to pay one's taxes with only one's PAN[112] card—linking it to Aadhaar was made mandatory in 2017); bank accounts (for receiving social welfare aid and paying taxes); one's phone operator; and potentially an entire series of commercial operators, such as travel agencies or credit scoring agencies. Thus, to quote Reetika Khera, "All the different silos of your life are connected via Aadhaar." She further says, "By linking all aspects of our lives (air and train travel, bank transactions, mobile usage, employment and health records, etc.), the UID project is creating a mass surveillance infrastructure which facilitates tracking and profiling of ordinary citizens."[113]

The idea of surveillance today is a two-faced Janus: one side stands for the intelligence gathering undertaken by the State, and the other refers to the new practices of the corporate world,[114] for whom "knowing one's customer" to the extent of profiling them, offers opportunities. This is done by creating a profile of potential consumers and users in areas as varied as banking, health, insurance, domestic help engaged, and, of course, everyday household consumption—all areas that can be covered by what Brittany Kaiser, the Cambridge Analytica whistle-blower, calls "digital kleptocracy."[115]

The second aspect will be considered first. That personal data is passed on to the private sector is clearly evidenced in the targeted advertisement that mobile telephone subscribers are regularly bombarded with—a sign that their consumption patterns have been fine-tuned by professionals extensively collating different files. These experts and entrepreneurs are known

as data brokers. Paul W., a domain specialist working at the World Bank, who has been cited earlier, explained how they have thrived in India by using Aadhaar data:

> The problem with the Indian system is that they stuck the same number on the Aadhaar card and they let all the service providers access this number. They opened a massive Pandora's Box. I'm a small service provider, I ask all my customers their Aadhaar number. I enter this number and refer to a data broker—who is not necessarily based in India and could be under a foreign jurisdiction and who has been supplied with a host of other information attached to the same number, that have been gleaned by other service providers. I press a button—all of it beyond the UIDAI's control—and I have a complete profile of the person. And this has enormous value for a whole range of services. (…) Telecommunications and banks again. But what I'm talking about is interesting for everyone—even the small service providers. So, by doing this, India has created a massive personal data black market. They have handed a deadly weapon to all service providers and data brokers for profiling.[116]

Apart from consumers, Aadhaar allows people to be profiled, particularly those whom others wish to employ in some capacity or the other. Thus, Usha Ramanathan reports that in 2016 an Indian firm called "TrustID" circulated an advertisement offering householders and other employers information on the past record of their tenants, domestic help and other people whose services they might use based on Aadhaar data. The radio advertisement offered "India's first Aadhaar-based mobile app to verify your maid, driver, electrician, tutor, tenant and everyone else instantly."[117] Even if TrustID was bluffing, the fact that this kind of advertisement could be broadcast on radio shows that there are potential clients who believe that a database like Aadhaar can be exploited for this kind of use. This itself reflects that the notion of surveillance has been internalised, which could likely lead to self-censorship, or even personal threats. In particular, these mechanisms were flaunted in broad daylight during the 2019 electoral campaign, when candidates pretended that they would be able to find out whom citizens had voted for in such and such locality, the underlying threat being that reprisals could follow if they did not vote as expected.

Further, promoters of Aadhaar did not rule out that this mechanism could put people's privacy at risk. R. Bansal indicated that "as long as the rule of law relatively prevails, if there is a strong legal background, we are in good shape," but adds regarding the Privacy Bill tabled in

Parliament that it could raise some problems due to the composition of the body in charge of managing the data, the Data Protection Authority (DPA). He points out, "the DPA does not have any independent member and this worries me as RBI and SEBI both have independent members; why would a DPA not have an independent member?"

Venkatesh Hariharan voices the same concerns while exporting Aadhaar abroad:

Another thing I'm concerned about is the human rights aspect and what happens if it falls in the wrong hands. So you should obviously not put this technology in a dictatorial regime but if you put it in a good regime and then it changes and falls into a totalitarian system it's highly dangerous. Having a system of checks and balances is essential. I've been travelling a lot, there is a lot of interest in other geographies in how to implement Aadhaar and other means of digital ID, and the issues of surveillance related to it. [But] one should have some human rights framework to implement it.

For some opponents of Aadhaar, the risks mentioned do not concern only the countries to which Aadhaar could be exported, but India itself due to the rising power of population surveillance mechanisms, such as the National Register of Citizens (NRC). Reetika Khera underscores that:

NPR and Aadhaar are actually the same thing, except they were given different States although both possibilities were also made available (…) the software was the same. When Aadhaar was operationalised through the UIDAI and their contractors, the registrars were allowed to add extra questions. Like for example, the banks were allowed to add 'Know Your Customers' and government departments were allowed to add 'Know Your Resident' section, allowed to ask even for mobile numbers. Aadhaar, therefore, is very intimately linked with not only the NPR but also the National Register of Citizens (NRC). NRC is the second stage of NPR—this is very clearly stated in Government documents going back to 2003. This was essentially a national security project emanating from the Kargil War but, I think, they knew if they openly stated that then there would be questions raised; so the real genius of Nandan Nilekani was to package it as a welfare programme.[118]

It was in Assam first—where the authorities had been trying for 30 years to identify Bangladeshi immigrants—that the NRC was implemented. According to Supriya Sharma, this endeavour draws largely on Aadhaar:

> In Assam, there were efforts to gather Aadhaar information from the people for the NRC. For the first time, the government is asking people their Aadhaar information as part of NPR, which will take place in 2020. The pilots they have conducted ask people for their Aadhaar information, they say it is not mandatory to furnish it but because most Indians are unaware, they would not think twice before disclosing it. We do not know how the government wants to use the Aadhaar information in the NRC and NPR but there are fears it will be used to exclude those who were not included in the citizen register. So, if you have not made it to the citizen register then your Aadhaar number could become the basis for your exclusion from government welfare schemes and services, deprived of voting rights.[119]

Apart from Assam, the decision in early 2020 to proceed to a fresh census for updating the 2010 NPR worried Muslims in India, given the Indian government's amendment last year to the Citizenship Act: illegal immigrants from Bangladesh, Pakistan and Afghanistan could henceforth acquire Indian citizenship provided they were not Muslims. Irfan Engineer explains that this law changed Muslims' idea of Aadhaar: as seen earlier, they did not hesitate to enrol under this system to be better recognised. Now the trap was closing on them, because now they had to prove their nationality. "Only Muslims need to prove their identity through documents. In small towns where municipalities used to get 40 applications a day for birth certificates are now getting 60,000 applications each day. So there is a lot of panic. Bureaucrats are getting money through bribes for getting the documents faster. Also, by causing insecurity, saying that there isn't any information about the person in the database."[120]

Conclusion

At this stage of the study, three types of conclusions may be drawn regarding the extent of Aadhaar's technical success, the winners and losers it has created, and its historic significance. As far as its technical deployment is concerned, to reuse the metaphor of the map and territory used in the introduction, it can be said that the map has expanded considerably and today covers around 92 percent of the territory. However, while its

expansion has increased, the range of information it contains still continues to vary a great deal. Different players pursue their goals of a detailed database and resultant finer understanding of "people," using different means. States build their database with information on social policies, and sometimes, on religion, caste and domicile of people; administrations surveil their officials, including sometimes their political opinions if they are academics; private companies develop their customer database (telephone numbers, purchase history, transactions as far as banks are concerned), etc. All these databases also contain the national identifier of individuals, the Aadhaar number. Therefore, on the one hand, there would be a general map, created by the UIDAI, vast but not very eloquent, something like the contour map of a steppe. On the other hand, there would be multitudes of layers on it: some juxtaposed, for the population of each state, some that cover almost the entire territory but contain isolated information, such as the telephone, big retailers, banks, train journeys, tax, etc. Compiling all these layers would make the project complete—and potentially dangerous for individual freedoms.

Which leads to the second point: the social consequences of the system in terms of winners and losers. The inconsistencies between the map and the territory—in the form, for instance, of errors in seeding an individual's bank account with the national identifier, or the erroneous declaration of death—are mostly borne by the people. Currently, the map is trusted more than the territory, and the territory suffers from it. One remembers that the goal of the UIDAI was to do away with "a person having two identities." For those who have been enrolled, this seems to have been well attained, and engenders some profit for companies, the State, and members of the middle class. On the other hand, the aim of ensuring that no person is without an official identity, which is in keeping with the UN's Sustainable Development Goal 16, has not been achieved. Initially presented as a means of resolving the problems of the poorest by improving the distribution channels of social benefit transfers, is Aadhaar not, ultimately, a new form of "technological solutionism"? Clearly, it is especially difficult for digital technology to resolve the problems of a country where infrastructure, beginning with electricity and internet connection, does not extend to the entire territory. Aadhaar seems better suited to the educated urban middle class, to which its promoters belong, rather than the working and rural classes. Its vision of India and its social problems hence remain very socially located and, due to this, ill suited.

Lastly, from the viewpoint of its historic significance, Aadhaar could be a terrible prototype. Conceived in a perspective that is, at best inclusive, and at worst purely commercial, it could ultimately serve as a weapon against democracy by setting up not only economic but also political surveillance. It would thus be a form of surveillance analogous to that studied by Michel Foucault for modern times,[121] but amplified today by the all-powerful influence of digital technology.

Notes and References

[1] *World Development Report 2016: Digital Dividends*. Washington, DC, World Bank, 2016.

[2] S. Zuboff, *The Age of Surveillance Capitalism.* London, Profile Books, 2019.

[3] Rule, James B, and G. W Greenleaf, *Global Privacy Protection: The First Generation.* Cheltenham/Northampton, Edward Elgar, 2008.

[4] UIDAI, "Aadhaar Dashboard," September 2019, https://uidai.gov.in/aadhaar_dashboard/index.php; "World Population Prospects, Population Division, United Nations." Accessed on 15 April 2020, https://population.un.org/wpp/DataQuery/

[5] Abbreviations and acronyms are listed at the end of the volume.

[6] For an overall analysis of this second phase, see Christophe Jaffrelot, *L'Inde de Modi: national-populisme et démocratie ethnique*, Paris, Fayard, coll. "CERI-Les grandes études internationals," 2019.

[7] The ensuing developments draw particularly on Bruce Schneier, *Data and Goliath: The Hidden Battles to Collect Your Data and Control Your World,* New York, W.W. Norton & Company, 2015; D.J. Solove, *The Digital Person: Technology and Privacy in the Information Age*, New York, New York University Press, 2004; C.O'Neil, *Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy.* London, Allen Lane, Penguin, 2016.

[8] Published in *The New York Times*, quoted by Schneier, *Data and Goliath, op. cit.*, Chap. 3.

[9] "Major events in the history of Infosys", Rediff.com, https://www.rediff.com/business/slide-show/slide-show-1-tech-major-events-in-the-history-of-infosys/20130602.htm#1, Accessed on 12 April 2020.

[10] Joël Ruet, "*Les multinationales indiennes et le capitalisme global*", in C. Jaffrelot, *New Delhi et le monde*, (Paris, Autrement, coll. "Ceri-Mondes et Nations"), 2008, 126-27, https://www.cairn.info/new-delhi-et-le-monde--9782746711969-p-125.htm

[11] Nandan Nilekani, *Imagining India: Ideas for the New Century*, 2009 ed., New Delhi, Penguin Books, 2008.

[12] Nilekani, *Imagining India …, op.cit.*, p.27

[13] Nandan Nilekani and Viral Shah, *Rebooting India. Realizing a Billion Aspirations,* London, Penguin, 2015.

[14] Interview with Charles Assisi, Mumbai, January 2020.

[15] Usha Ramanathan, "Blundering alone, dangerously," *Frontline*, 28 April 2017.

[16] S. Desai, N. Jasuja, "India Stack: The Bedrock of a Digital India. A Guide to the India Stack and its Disruptive Potential," Medium.com, 28 October 2016, https://medium.com/wharton-fintech/the-bedrock-of-a-digital-india-3e96240b3718, Accessed on 25 October 2018.

[17] Dipa Sinha, "Cost of Implementing the National Food Security Act," *Economic and Political Weekly* Vol. 48, Issue No. 39, 2013. Opposition to the NFSA was mostly due to the costs that this law implied.

[18] *The Times of India*, "Rajiv was right: Montek says only 16p of Re reaches poor, 14 October 2009, https://timesofindia.indiatimes.com/india/Rajiv-was-right-Montek-says-only-16p-of-Re-reaches-poor/articleshow/5121893.cms, cited by Shankkar Aiyar, *Aadhaar: A Biometric History of India's 12-Digit Revolution*, Delhi, Westland Publications, 2017, p.4.

[19] UPA—United Progressive Alliance is a coalition of political parties led by its main party, the Indian National Congress.

[20] Aiyar, *Aadhaar…, op.cit.,* Chap. 2–3.

[21] *Ibid.,* p. 39

[22] *Ibid.*, pp. 16–22.

[23] R.S. Sharma, Interview no.2, 2020. R.S. Sharma also wrote an extensive account of its career around Aadhaar and other technological issues, with many insights concerning our topic: Sharma, R.S. *The Making of Aadhaar. World's Largest Identity Platform*. New Delhi, Rupa Publications, 2020.

[24] https://iitk.ac.in/dora/profile/Mr-Ram-Sewak-Sharma Accessed on 24.06.2021

[25] Aiyar, *Aadhaar…, op.cit.*, p. 26.

[26] Loraine Kennedy, "Le fédéralisme indien: un système centralisé en voie de rééquilibrage," in Christophe Jaffrelot (ed.) *L'Inde contemporaine*, Paris, Fayard, coll. "Pluriel," 2019.

[27] Aiyar, *Aadhaar…, op.cit.*, pp. 65–66.

[28] *Ibid.*, p. 37.

[29] R.S. Sharma, Interview no.1, Delhi, TRAI Office, 2019.

[30] R.S. Sharma, Interview no.2, 2020

[31] Interview with Paul W., Paris, in a café across Quai d'Orsay, 2020.

[32] Two interviews with R.S. Sharma.

[33] Aiyar, *Aadhaar…, op. cit..*, pp. 37–43.

[34] The British Empire used fingerprints to monitor the movements of labourers in South Africa – a practice that Gandhi had fiercely opposed. See K. Breckenridge, *Biometric State: The Global Politics*

of Identification and Surveillance in South Africa, 1850 To the Present, New York, Cambridge University Press, 2014.

[35] First interview with R.S. Sharma.

[36] Second interview with R.S. Sharma.

[37] R.S. Sharma, *ibid.*

[38] Ramakumar, Interview (Mumbai, on telephone, 2018).

[39] Second interview with R.S. Sharma.

[40] Tarangini Sriraman, *In Pursuit of Proof: A History of Identification Documents in India*, Delhi, India, Oxford University Press, 2018.

[41] Bidisha Chaudhuri, "Paradoxes of Intermediation in Aadhaar: Human Making of a Digital Infrastructure," *South Asia: Journal of South Asian Studies,* Vol. 42, No. 3 (4 May 2019), pp. 572–87, https://doi.org/10.1080/00856401.2019.1598671

[42] Reetika Khera, "On Aadhaar success: It's all hype—That includes the World Bank," 25 July 2016, https://www.ndtv.com/opinion/yes-aadhaar-is-a-game-changer-in-wrecking-welfare-schemes-1434424.

[43] Interview with Martin Macwan, Ahmedabad, near IIM, 2020.

[44] Aiyar, *Aadhaar…*, *op. cit.*

[45] Reetika Khera, "Impact of Aadhaar on Welfare Programmes", *Economic and Political Weekly,* Vol. 52, No. 50 (2017): 67, personal calculations.

[46] Second interview with R.S. Sharma.

[47] The ensuing developments draw on Srinivas Kodali's "As Security Violations Erupt, the Operator of India's Biometric Database Stands at a Troubling Crossroad," *The Wire*, 25 February 2017

[48] *Scroll.in*, 14 September 2017.

[49] *The Times of India*, 24 February 2017.

[50] A. Madanapalle, "A simple Google search delivers databases with Aadhaar numbers, but Aadhaar is not compromised," *Firstpost*, 14 March 2017, https://www.firstpost.com/tech/news-analysis/a-simple-google-search-delivers-databases-with-aadhaar-numbers-but-aadhaar-is-not-compromised-3699883.html

[51] *Scroll.in*, 5 March 2017.

[52] *Medianama*, 24 April 2017.

[53] *Scroll.in*, 25 April 2017 and 19 November 2017.

[54] *Scroll.in*, 5 March 2017.

[55] *The Tribune*, 4 January 2018, and *Scroll.in*, 7 January 2017.

[56] In the list of the seven challenges identified by the agency for its project, the first and the third to be mentioned are an insufficient number of enrolments, along with obvious aspects like solid political backing, issues of privacy (Cf. II. C below) and technological risks 5reliable storage, etc.). See "UIDAI Strategy Overview" (Planning Commission, February 2010).

[57] Aiyar, *Aadhaar…, op.cit*. p. 70.

[58] *The Times of India*, "Have Aadhaar? Get passport in 10 days," 16 February 2015, http://timesofindia.indiatimes.com/city/kolkata/Have-Aadhaar-Get-passport-in-10-days/articleshow/46256405.cms

[59] C. Jaffrelot, *L'Inde de Modi*, *op. cit*.

[60] Interview of Irfan Engineer, Mumbai - Bandra, 2020.

[61] Michael Lipsky, *Street-Level Bureaucracy. Dilemma of the Individual in the Public Service,* New York, Russel Sage Foundation, 1980.

[62] Informal discussions with Muhammad, Delhi - GK II, 2018.

[63] Sakshi Dayal, "Woman who gave birth in front of hospital wants an Aadhaar for her daughter," *Indian Express*, 27 September 2018.

[64] UIDAI, "Aadhaar Dashboard," 2018, https://uidai.gov.in/aadhaar_dashboard/india.php

[65] "The National Identification Authority of India Bill, 2010," Pub. L. No. LXXV (2010).

[66] London School of Economics and Political Science, Department of Information Systems, "The Identity Project. An Assessment of the UK Identity Cards Bill and Its Implications," London, LSE, 27 June 2005, http://eprints.lse.ac.uk/29117/

[67] Modi, in a tweet on 8 April 2014 had said of Aadhaar: "There is no vision, only political gimmick" quoted in R. Khera, "Post-script," in R. Khera (ed.), *Dissent on Aadhaar*, *op. cit*., p. 248.

[68] Charles Assisi reveals on this matter: "…one of campaign promises of Modi and the BJP was that if voted to power, they would shelve it. He [Nilekani] was adrift when the BJP came to power in 2014 and thought the project was a dead letter. Nonetheless, he went to present the project to Modi, and after five minutes the latter stopped him, saying that he was familiar with the project, that he had gone through it thoroughly. The project would continue, but under one condition: I will be its face. Nilekani had no objection to this. All this was just politics."

[69] Drèze, Jean. "Hello Aadhaar, Goodbye Privacy," *The Wire*, March 24, 2017. https://thewire.in/government/hello-aadhaar-goodbye-privacy.

[70] The developments that follow draw on S. Prasanna's, "Aadhaar - Constitutionally Challenged", in R. Khera (ed.), *Dissent on Aadhaar*, Hyderabad, Orient BlackSwan, 2019, 137–48 and various press articles.

[71] G. Bhatia, "The Privacy Judgement," in R. Khera (ed.), *Dissent on Aadhaar*, *op. cit*., p. 155.

[72] Supriya Sharma, informal discussion, Mumbai, Colaba, 2020.

[73] S. Prasanna, "One Year of India's Right to Privacy: No Step Forward and Two Steps Back," *The Wire*, 24 August 2018, https://thewire.in/law/india-right-to-privacy-aadhaar-srikrishna-committee

[74] See F. Godement, "Données personnelles : comment gagner la bataille," Paris, Institut Montaigne, December 2019.

[75] ID4D, "Private Sector Economic Impacts from Identification Systems," Washington DC, World Bank, 2018.

[76] Interview with Venkatesh Hariharan, Mumbai - IDFC Institute, 2020.

[77] The data that follows are sourced from the "RBI Bulletin," Reserve Bank of India, February 2020, p.89.

[78] N.S. Ramnath and C. Assisi, *The Aadhaar Effect: Why the World's Largest Identity Project Matters*, Oxford University Press India/Founding Fuel, 2018, pp. 161–63.

[79] World Bank, World Development Report 2016: Digital Dividends, *op.cit*.

[80] *Ibid*., "Spotlight #4: Digital identity", pp. 194–197.

[81] P. Barnwal, "Essays in Development, Environment and Health," Ph.D., Columbia University, 2015

[82] S. George and A. Subramanian, "Transforming the Fight against Poverty in India," *The New York Times*, 22 July 2015, Opinion, https://www.nytimes.com/2015/07/23/opinion/transforming-the-fight-against-poverty-in-india.html

[83] A. Subramanian and S. George, "Clearing the Air on LPG," *The Indian Express* (blog), 2 April 2016, https://indianexpress.com/article/opinion/columns/clearing-the-air-on-lpg-direct-benefit-transfer-subsidies/

[84] World Bank, "World Development Report 2016: Digital Dividends," *op. cit.,* p. 195.

[85] S. Banerjee, "From Cash to Digital Transfers in India: The Story So Far," CGAP brief, February 2015, https://www.cgap.org/research/publication/cash-digital-transfers-india-story-so-far

[86] R. Khera, "On Aadhaar Success, It's All Hype —That Includes the World Bank," *op.cit*.

[87] A. Venkatanarayanan, "The Curious Case of the World Bank and Aadhaar Savings," *The Wire*, 3 October 2017, https://thewire.in/economy/the-curious-case-of-the-world-bank-and-aadhaar-savings

[88] K. Muralidharan, P. Niehaus and S. Sukhtankar, "Building State Capacity: Evidence from Biometric Smartcards in India," Working Paper 19999, NBER Working Paper Series, March 2014, https://doi.org/10.3386/w19999

[89] "Report of the Comptroller and Auditor General of India on Implementation of PAHAL (DBTL) Scheme," New Delhi, CAG, 2016

[90] Interview of Rajesh Bansal, New Delhi, Carnegie India, 2020.

[91] Interview with Venkatesh Hariharan, *op. cit.*

[92] Interview with Charles Assisi, *op.cit*.

[93] Interview with Paul W., *op. cit.*

[94] Interview with R. Bansal, *op. cit.*

[95] E. Morozov, *To Save Everything, Click Here: The Folly of Technological Solutionism*, New York, Public Affairs, 2013.

[96] R. Khera, "Impact of Aadhaar on Welfare Programmes", *op. cit*., pp. 25–45

[97] J. Drèze, N. Khalid, R. Khera, A. Somanchi, "Aadhaar and Food Security in Jharkhand", *Economic and Political Weekly*, Vol. 52, No. 50, 2017.

[98] R. Khera, "Impact of Aadhaar on Welfare Programmes", *op. cit*., p. 34

[99] *Ibid.*

[100] *Scroll.in*, 19 December 2017

[101] "After SC verdict on Aadhaar, question for AAP govt: what of PDS, pension?", *The Indian Express*, 27 September 2018

[102] Interview with R. Khera, Ahmedabad, 9 January, 2020.

[103] *Hindustan Times,* 7 October 2017

[104] *Scroll.in*, 1 June 2016. On the Jharkhand case, see also *Scroll.in*, 2 February 2017 and *The Hindu*, 17 January 2018.

[105] *Scroll.in,* 2 January 2018.

[106] Nikhil Dey, *Scroll.in,* 1 June 2016.

[107] *The Hindu,* 10 January 2018.

[108] Reetika Khera, "The Poor Are Left to Themselves: the Benefits Being Projected in Aadhaar's Name Are Not Backed By The Data," *The Hindu*, 29 September 2018.

[109] J. Drèze, N. Khalid, R. Khera and A. Somanchi, "Aadhaar and Food Security in Jharkhand: Pain without Gain?" *Economic and Political Weekly,* 16 December 2017, pp. 50–59

[110] Aarefa Johari, "Denied food because she did not have Aadhaar-linked ration card" *Scroll.in*, 16 October 2017.

[111] A. Yadav, "Rajasthan's Living Dead: Thousands of Pensioners without Aadhaar or Bank Accounts Struck Off Lists," *Scroll.in*, 6 August 2016, https://scroll.in/article/813132/rajasthans-living-dead-thousands-of-pensioners-without-aadhaar-or-bank-accounts-struck-off-lists

[112] The Permanent Account Number (PAN), issued by the Income Tax Department, is the method used to identify Indian taxpayers.

[113] R. Khera, "Introduction," in R. Khera (ed.), *Dissent on Aadhaar*, *op. cit*., pp. 13–14.

[114] See S. Zuboff, *The Age of Surveillance Capitalism*, *op.cit.*

[115] B. Kaiser, *Targeted: My Inside Story of Cambridge Analytica and How Trump, Brexit and Facebook Broke Democracy*, London, HarperCollins, 2019.

[116] Interview with Paul W., *op. cit.*

[117] U. Ramanathan, "Aadhaar – From Welfare to Profit", in R. Khera (Ed.), *Dissent on Aadhaar*, *op. cit*., pp. 183.

[118] Interview with R. Khera, *op. cit.*

[119] Interview with S. Sharama, *op. cit.*

[120] Interview with I. Engineer, *op. cit.*

[121] Michel Foucault, *Discipline and Punish: Birth of the Prison* (original title: *Surveiller et Punir. Naissance de la Prison*, Collection Tel, Gallimard, Paris, 1975)