Development
https://doi.org/10.1057/s41301-024-00409-3

UNPLUGGED

Feedback and (Social) Loop: Biometric System and the Digital Empire in India

Rajiv K. Mishra[1]

Abstract
In a technological system, feedback means learning and getting information on system functions and performance. The cyclical process through which data is collected, delivered, and assimilated is called a loop. The concept of feedback and its loop were adopted from biological organisms and translated into cybernetic system design. Similarly, the everyday operations of a technological system interact with users, and their interaction can be termed feedback connected through a social loop. A social loop can mean everyday interactions of users with a technological system and an automated loop for collecting, delivering, and assimilating feedback information on system performance and functioning. Feedback through machine and social loops can provide a crucial understanding of the everyday operation of technological systems and their use for development. In this context, the key focus of this article is to juxtapose automated feedback from the machine loop and feedback from the social loop of the biometric system in India. In doing so, the article intends to critically unpack the operational reality of the empire of digital welfare and the triad alliance of state, international development organizations, and market players driving it in India. The article's methodology is based on the use of 50 qualitative unstructured interviews, three focus group discussions, and two weeks' personal observation diary notes. The empirical fieldwork data were collected from four districts of Delhi and Jharkhand in India in October 2017 and February 2018.

Keywords Feedback · Loop · Biometrics · Digital · Identification · Infrastructures · Empire · Welfare · Development

The Focus

There are numerous instances in our daily lives that we come across the term feedback. Feedback in the context of technological systems means learning and getting information on functions and performance per desired purpose. A loop is the cyclical process through which data is collected, delivered, and assimilated into the system. In historical context, the term feedback was borrowed from plant organisms and their feedback mechanisms to communicate for their survival. Using information from operational feedback was an essential part of the technological system. Considering feedback as a critical part of the automated operation of a technological system, also being a sociotechnical system due to their social use and context, gives rise to social feedback through the social loop of experiencing, knowing, and understanding the operation of a system. India's UID (Unique Identity aka Aadhaar)[1] is one such pervasively existent large sociotechnical (digital) system that makes the case for social feedback and social loop crucial due to its embedding and operation through its institutional sites.

[1] UID is a 12-digit unique identity number which is algorithmically generated after collecting biometrics (10 fingerprint scans, both iris scans and a facial photo) and demographics (name, age/date of birth, parents/spouse, address) data.

✉ Rajiv K. Mishra
rajiv.mishra@northwestern.edu

[1] Northwestern University in Qatar (NUQ), Education City, Doha, Qatar

Published online: 13 September 2024

Running with a Herculean enrolment of 1.4 billion people in a database, the biometrics UID system impacts millions of lives daily.[2] This massive system is operated across various components of policy, technology, actors, institutions, and market players. However, focusing on technology and actors opens up the aspects of the operation and interaction of the system with society. The key technological components of this biometric system are the central identity repository (database), network connectivity, biometric authentication devices, application interface, and mobile phones. Among its actors are those who operate and are associated with its bureaucratic management and those users with a biometrics-based digital identity who use it to access welfare entitlements. Those users who use the system daily to access various welfare entitlements are also termed beneficiaries by the government. Biometric interaction practices with the system are done through various institutional outposts of this empire of digital welfare. These institutions are food grain distribution shops/ration shops, banks, and digital services centres. Biometrics-based identification and authentication practices are socially and geographically located in these institutions through a public–private operation model. These practices, in turn, incorporate crucial user experiences and feedback with their attempts to use and traverse the system to access entitlements.

Just like the transactions in a machine, this technological system incorporates collection, delivery, and assimilation of 'automated transaction information.' Similarly, the interaction of users incorporates experiential information and knowledge, which can be termed 'social transaction information,' which is crucial for critically analyzing the systems' guiding principles, performance, and functions. Thus, juxtaposing feedback from the machine loop with 'automated transaction information' and feedback from the social loop with 'social transaction information' becomes crucial. Moreover, the data and statistics from technological transactions of this biometric system are being used to depict aggregations of the efficient functioning of the welfare state. However, the complete details of all the automated transactions (failed transactions) are not being presented by the state, making the case of the social loop more crucial in connecting the missing bits and pieces of the everyday operation of the biometric system. In this context, the focus of this article is to juxtapose and show the crucial significance of the social loop mechanism in better understanding the everyday operations of technological systems. Focusing on the social loop is methodologically more critical since the Indian state does not provide any official data and statistics from the automated feedback on the failed transactions of the biometrics system in operation.

Literature and Conceptual Framework

The concept of feedback in technological systems was borrowed from living organisms (plants) by Norbert Wiener, a mathematician in his pioneering work *Cybernetics, or the study of control and communication in animals and machines* (Wiener 1948). In this theory of cybernetics, the automata/automatic machine was embedded with a circular causality (loop) of incoming and outgoing messages (Wiener 1948). The concept of 'servomechanisms' is essential for automatic circular causality, a mechanism that automatically reads information and adjusts its functions and goals, e.g., thermostats, anti-aircraft guns, and automatic ship steering systems (Wiener 1948; Birnbaum 1989). Bounded by time and space, Wiener's cybernetic system existence in each environment depended on a circular exchange of information, a loop (Wiener 1948). A loop providing feedback information, both negative and positive. However, negative feedback information was essential for course corrections and adjustments for maintaining homeostasis and achieving system goal(s), i.e., an equilibrium and stable goal-centric performance of the system (Wiener 1948; Jonas 1953; Cadwallader 1959). However, for first-generation (first-order) cybernetics, the use and role of negative feedback information were crucial and important for automatic course corrections and adjustments to achieve system goals (Wiener 1954; Tomas 1995).[3]

Cybernetics, primarily initiated from the science, engineering, and technology fields, greatly impacted other disciplines such as sociology, anthropology, economics, language, communication, and psychology (Heims 1991).[4] However, the social science application of cybernetics came with criticism and objection to homeostasis, equilibrium, and stability due to social systems being inherently prone to

[2] The current population of India is ~ 1.44 billion, surpassing China, India is now the world's most populous country. As per date the total enrolment in the biometrics UID system stands at 1.4 billion covering almost the entire population of the country. The central government agency which has designed, implemented, and operates the UID system is called the Unique Identification Authority of India (UIDAI). For more details see, https://www.unfpa.org/data/world-population/IN and https://uidai.gov.in/aadhaar_dashboard/

[3] First order cybernetics originated from 1940s, mainly from Norbert Wiener's work on control and communication. From 1970s onwards, second order cybernetics started with more social science application and criticism of first order cybernetics due to its focus on homeostasis and stability. Second order cybernetics was focused on positive feedback information, autopoiesis (reproduction), morphogenesis and change to understand evolutionary aspects of living organisms and society.

[4] The interdisciplinary group which came together to study and use the concept of cybernetics came to be known as the cybernetics group.

social change (Parsons et al. 1953; Forrester 1969).[5] However, the focus on positive feedback information for studying and understanding living systems with evolutionary and social complexities became known as second-generation (second-order) cybernetics (Geyer 1995). At the intersection of these two orders of the cybernetic systems approach, sociocybernetics emerged to study and understand societies and communities (Geyer and van der Zouwen 1991; Almaguer-Kalixto and Giglietto 2019). They were providing epistemological positions to understand interactions for better and participative societies (von Foerster 1974; Scott 2008; Espejo and Lepskiy 2021).

However, the conceptual framework that I adopted for this article and the understanding of feedback and social loops is not devoid of first-order cybernetics. It strongly uses first-order cybernetics concepts of circular loop, feedback information, and homeostasis in the context of understanding automatic biometrics systems in India. My approach to understanding negative feedback information from the social loop is crucial to critically argue about the inability and failure of the biometrics system in India to deliver and achieve its system goal(s), i.e., providing biometric-digital-based access to welfare entitlements. The biometrics system is a man-made automatic socio-technological system due to its social and spatial nature of operation and interaction with users. Moreover, my argumentative position on social feedback information (critical and negative) is from the interactional nature of communication between machines and humans, which was the core focus of Wiener's approach. Access to welfare entitlements for everyday life is my homeostatic approach–the stability needed for such groups to access food, social security, livelihoods, and financial transfers to sustain their lives. Understanding feedback information from social loops of such large sociotechnical systems for governance and development bears crucial significance for a society with a high percentage (±22%) of poverty utterly dependent on the welfare state.[6]

Methodology and Empirical Data

The methodological approach of the article is based on understanding the ground-level operation of the biometric system and the empire of digital welfare in India from various spatial and social sites of its operational use. The spatial and social sites are where biometric transactions and practices of the biometrics-based digital welfare operate, interact, and unravel while interacting with system users. In these sites, different public–private institutions operate biometrics-based welfare entitlement accessibility services. These institutions are ration/food grains distribution shops, banks, and digital service centres. By using empirical data collected through qualitative unstructured brief and in-depth interviews, personal diary notes, and observation of biometric-based entitlement transactions and financial transactions, the article relies on a total of 50 interviews and three focus group discussions (FGD) from two districts of Jharkhand and two districts of Delhi.

In these sites, the interviews, informal discussions, field diary notes, and observations of transactions incorporate details of users who are also known beneficiaries of various welfare entitlements. For example, users belonging to impoverished groups depend on biometrics-based accessibility of food welfare entitlement, users who use it to access social security financial transfers from the central government for old age, and those who use it to access money from banks for their entitlement financial transfers. Moreover, it also details actors operating the system in these institutional locations and the collective observation of the spatial and social nature of the system's operation every day. These actors are government officials, bureaucrats, village representatives, ration/food grains distributors/dealers, bank staff, owners and operators of digital service centres, community social workers, and village-level coordinators of entitlement programmes.

The Biometric System: Empire of Digital Welfare

The biometrics (UID/Aadhaar) system operating in India is a unique-in-the-world, gigantic biometrics-digital welfare system run on a Herculean scale.[7] If we take the scale of the system in terms of people enrolled in it and its pervasive use on an everyday basis, it reflects an empire of digital welfare.

[5] One of the major criticisms of first order cybernetics was its focus on control and communication for homeostasis, which related to stability and stagnation rather to change and dynamism. It was considered reductionist and having technocratic bias.

[6] Former Planning Commission of India in July 2013 had released poverty estimates at 21.9% (~22%).

Moreover, The World Bank in its poverty percentage reporting of India still uses and refers to the same poverty estimate of 21.9% with the most recent reference year of 2011. https://data.worldbank.org/indicator/SI.POV.NAHC?locations=IN&most_recent_value_desc=false

Furthermore, there has been a controversial claim of drastic poverty reduction, and its depiction based on Multidimensional Poverty Index (MPI) by Government of India. However, many economist and development experts have questioned the new poverty estimation, and apparent lack of reliable data and incorporating any details on COVID-19 pandemic induced poverty. For more details see, https://www.dw.com/en/indias-poverty-debate-truth-behind-the-numbers/a-68062699

[7] The transaction scale of the system is colossal, until date, a total of ~90 billion total biometrics authentication transactions have taken place. Out of which, 88.4 billion is for fingerprint authentication transactions and 1.4 billion are for iris authentication transactions. For more details, see central UID/Aadhaar dashboard, https://www.uidai.gov.in/aadhaar_dashboard/auth_trend.php

This empire, operating with the core structure of biometric-based digital identification and authentication, shows two realities: the policies and guiding principles of system design by its builders, including policymakers, expert committees, system architects, engineers, and programmers. Moreover, along with this cohort of system builders, there is a strong alliance of market-incorporating national and international corporations/companies dealing in biometrics, software, and hardware technologies. On the other hand, this empire of digital biometrics-based welfare also reflects a reality that exists at the ground level, at the level of users, especially people facing socio-economic hardships and inequalities. For the users belonging to this population group, it is a particularly dire and compulsive situation for them to constantly prove their digital identity with the help of biometric authentication to access life-sustaining welfare entitlements. Biometric transactions to access entitlements are at the core of the engine running the empire of digital welfare.

The visible side of these transactions to access welfare entitlements is both at the level of machine-automated feedback and the experiential feedback that the user encounters in the process. When a transaction is attempted, and if the biometric authentication is successful, access to the concerned entitlement is provided. On the other hand, if it fails due to problems with biometrics scans or any technological infrastructure-related issue, the log of the failed transaction is also recorded. However, through its central UID/Aadhaar dashboard, the state only reports authentication transactions in an aggregate manner. It does not provide details on whether it was a successful or a failed transaction. An official from the UIDAI regional office in Jharkhand said: 'All the transactions are recorded in the dashboard, it is available in the public domain, you can see it […]'.[8] However when asked about the proportion of failed transactions, and if data analytics of both successful and failed transactions is used, he did not provide any details.[9]

Despite this, the state projects only the visible side or, put differently, one side of this reality by showing statistical aggregation of authentication transactions without providing details of failed transactions. Thus, the other side of the system operation is invisible and remains unknown and hidden. The experience and information users acquire are crucial to understanding and deciphering the operational reality of this sizeable digital empire of governance and development, impacting millions of human bodies on an everyday basis. The narrative tales of users based on their everyday experience tell a story(s) on how they negotiate the challenges and realities of this biometric system and the vast empire of digital welfare in India.

Machine, Biometrics, and Scans: Automated Feedback and Social Loop

Automated Feedback

When attempting a biometrics identification and authentication transaction, the system generates a message–a data packet–sent to the UID central database server. Suppose the requested data packet with the user's biometric identification details is present and correct as per the database record. In that case, the transaction will be successful, and the concerned entitlement will be accessed. In this process, the authenticated data packet request with the user's personal identifier (PID) details gets an automated 'success' response from the system. This is essentially a machine-based automated feedback loop aimed at proving the identity of the user. The success feedback response is either through an IVRS (interactive voice response system) message from the biometrics machine or through a message on the monitor display of the biometric device. As a user/beneficiary dependent on food entitlement welfare said,

> we go and deposit our ration card; accordingly, the dealer calls our name, and then when my turn comes, the machine work starts. I must provide the fingerprint, and if the scan is successful, there will be a voice from the machine and a slip will be generated.[10]

However, the automatic feedback loop also responds to a failure or failed authentication transaction when there is a problem with biometrics scans, any specific error, or an inability to communicate successfully with the central server. On this, another beneficiary user said,

> it's an old disease from the time the machine came. We are often told that the link has failed or the network is not working. Along with the problems of fingerprint scans, from the time this machine came, it has created more problems and challenges for us […].[11]

When asked about the biometric process of accessing food entitlement, the food distribution dealer said, '[…] I must get their (users') fingerprints scanned. If it does not work after three attempts, then the machine automatically sends an OTP

[8] ITW (Interview)#45, Official, UIDAI Regional Office, Ranchi, Jharkhand, Jharkhand Fieldwork on UID, 17 October 2017.

[9] At the ground level bureaucracy, officials when asked about whether they know about the pattern of biometrics transactions and if they use it for addressing concerns and challenges of users, said that for that they do not have the required infrastructures!

[10] ITW #27, Women Beneficiary, Specific Village Panchayat, Namkum Block, Ranchi District, Jharkhand Fieldwork on UID, 13 October 2017.

[11] ITW #13, User from a poor family, Specific Village, Tamar Block, Ranchi District, Jharkhand Fieldwork on UID, 6 October 2017.

(one-time password) to their registered mobile number'.[12] However, at times, there is a problem with everything–the machine, biometrics, network, and the OTP. Problems with biometric scans, waiting for network/link, and OTPs make the process wholly technology-driven and dependent without alternative fallback mechanisms.

A two-sided reality unfolded from these narrative tales and my on-site observation of the biometrics-based entitlement transactions. One was behind (or rather inside) the machine and the entire infrastructure trying to operate the system successfully, and the other was users/beneficiaries eagerly hoping for a successful transaction. The moment there is a successful response from the machine through interactive voice, a sense of relief and gladness prevails. However, system failures led to a strong sense of frustration, particularly from people and groups forced to sacrifice a day's wage work to access the entitlement. The technological negotiation with biometric scans and proving one's digital identity seems to have become a cultural interaction where multiple meanings and counter-narratives have become part of everyday life, especially in rural areas.

Beneficiaries in rural areas have come to strongly believe that the machines, biometric scans, and automated feedback are vital for them to be considered 'trustworthy.' If they don't own a digital identity, they don't exist; if the biometric scans do not work, they don't exist and cannot access life-sustaining entitlements. They are living with a constant dilemma of whether the machine will work, which certainly brings more uncertainties with rigidly structured biometrics-digital systems.

Social Loop

However, the daily use of the system to access various development services also generates cultural experiences, learning, and knowledge from its users. This generates a parallel, equal, or even more critical feedback loop on the system's operation and performance. Because it relates to the system's spatial and social site interaction with its users, it is a crucial loop for understanding the everyday reality of the system's operation. To understand social reality(s) from how the system operates and whether it is making peoples' (users) lives more accessible and more convenient, making delivery of entitlements more efficient and faster for bureaucratic governance. More so, this loop also reflects upon how the system was planned and operated in a highly diverse social and geographic context, India. From the beginning of its conceptualization, policy planners emphasized that the UID heralded the arrival of a 'game-changing' role in revamping the delivery of welfare entitlements.

When asked whether their lives have become easier with the biometric system, a beneficiary said, '[…] Government says with biometrics everything is easy, so why doesn't it work when we provide our biometrics, neither for rations nor for banking services […]'.[13] Another user, when asked whether things have become efficient with biometrics and governments' claim on it, said in disagreement, '[…] no, what they say that speed of work has changed with biometrics Aadhaar is not true at all. Even now, the speed is the same as it used to be in the past […]'.[14] Furthermore, another user reflecting on deeper ground realities of the system and its impact in rural society said, '[…] see with Aadhaar what government claims that everyone is having an ease of access with things is not true'.[15] While discussing and trying to converse in-depth with a user, he mentioned, '[…] I don't think that Aadhaar can be a solution to the problems we face. It is claimed that the machine takes minutes, but sometimes it takes the whole day, and it still does not work.[16] Sharing more details about the travails a beneficiary must go through, from visiting the designated institutional site to accessing the entitlement to the attempt to authenticate oneself biometrically, said, '[…] ration shop only opens for 2–3 days in a month […], and if my fingerprint does not work, then I must go next day […] and if still, it doesn't work, then I need to go next month'.[17] Moreover, sharing about the problem of fingerprint scans in getting the rations, a female beneficiary said, 'When we go to accessing rations, the fingerprint does not work, it's very problematic, even after many attempts it's not working, and then when it does not work the dealer says an OTP will come to your mobile'.[18] Reflecting the complicated nature of things, a beneficiary belonging to a tribal community and being dependent on social security support of old age pension said, 'It's been eight months since I did not get my pensions, many times the fingerprint does not work, and many times they say the pension money has not come […]'.[19]

[12] ITW #14, User from a poor family, Specific Village, Tamar Block, Ranchi District, Jharkhand Fieldwork on UID, 6 October 2017.

[13] ITW #17, Old Aged Beneficiary from a poor family, Specific Village Panchayat, Tamar Block, Ranchi District, Jharkhand Fieldwork on UID, 6 October 2017.

[14] ITW #10, A member of a beneficiary/user family, Old Aged, Specific Village, Murhu Block, Khunti District, Jharkhand Fieldwork on UID, 3 October 2017.

[15] ITW#32, Beneficiary, Specific Village, Namkum Village, Ranchi District, Jharkhand Fieldwork on UID, 13 October 2017.

[16] ITW #11, Old Aged Beneficiary, Specific Village, Torpa Block, Khunti District, Jharkhand Fieldwork on UID, 4 October 2017.

[17] ITW #20, Beneficiary, Specific Village, Tamar Block, Ranchi District, Jharkhand Fieldwork on UID, 6 October 2017.

[18] ITW #1, Beneficiary, Specific Village Panchayat, Khunti Block, Khunti District, Jharkhand Fieldwork on UID, 2 October 2017.

[19] ITW #9, Old Aged Beneficiary of the Social Security Entitlement, Murhu Block, Khunti District, Jharkhand Fieldwork on UID, 3 October 2017.

Furthermore, sharing more profound insights on the ground reality of biometrics-based access to entitlement, a beneficiary who seemed not confident about the success of a biometrics-based digital welfare system said, 'Sometimes I don't understand whether things have become faster with digitalization or slower with it […] now without machine, network, fingerprint, OTP, we cannot get our rations, it is very complicated'.[20] Furthermore, adding to this view, a person working as a coordinator for a rural livelihood entitlement programme said: 'With UID, things have not improved for livelihoods entitlement; it has become rather more difficult and complicated for us; it is proving to be completely negative […]'.[21] Reflecting the deeper realities of digital welfare, another coordinator said, '[….] with digitalization things in rural livelihood entitlement have become strangely slow, especially with payments, and now people in rural areas would rather not work in the rural livelihood entitlement program'.[22]

The way people narrate and share their social feedback with embedded and contextual realities, the grand narratives and claims of the state get debunked with strong disagreement and discontent with the very idea of digital technology-led development. Users and social feedback accounts reflect more paradoxical realities, hidden and untold from the central transaction dashboard's projected and propagated statistical reality. Moreover, for a country like India with extreme social and economic discrimination and inequality, it bears crucial implications, particularly for the millions of people who are dependent on the state for welfare support. Thus, social feedback through a spatially situated social loop becomes a crucial point of entry to understanding ground-level practices of a technological system.

In(Significant) Voices: Users, Social Loop, and System

The fundamental goal of the UID system, as approached and designed by technical experts, was to create an efficient, digital, and secure system for accessing welfare entitlements. Nevertheless, seeing how the system has been implemented, it seems to be less focused on learning from and incorporating user feedback.

Initially, when the UID project began, an 'Awareness and Communication Strategy Advisory Council' was constituted.[23] In a seven-member council/ committee, there were four members from the corporate sector, one member from an NGO (Non-Governmental Organization), two members nominated by UIDAI, and a representative of the UIDAI.[24] The council's report emphasized specific keywords such as 'stakeholders,' 'objectives,' 'individuals,' 'brand value,' 'messages,' 'challenges,', 'feedback and learning' (for communication strategy), and 'working with partners' and 'available resources.'[25] The emphasis on feedback and learning mentioned: 'to ensure that the communication plan is continuously updated, and course correction mechanisms brought in when required.'[26] The importance of feedback and learning was limited to the communication plan and strategy and is not focused on systematic feedback from users on the ground, or operations and usage of the system.[27] In such a mammoth technological system, the absence of design considerations in feedback from social loop incorporating users' inputs for addressing challenges and critical problems bears social, economic, and political implications. As reflected in the words of a government official:

> A few days back, what happened is that around 1,000 tribals from several villages surrounded our entire office compound. They were not getting their rations through biometric machines for several months – it became a tipping point […].[28]

In the villages, many users shared strong views and frustration with the operational use of the system. These views deeply reflected their frustrations' highlighting social, economic, and political reasons for their dissatisfaction. A user said, 'After enrolment, nobody came, nobody comes for asking and taking feedback and to understand our grievances

[20] ITW #46, PDS Beneficiary, Urban Village, Southwest Delhi District, Delhi Fieldwork on UID, 9 February 2018.

[21] ITW #36, Specific Person, FGD, Livelihood Programme Coordinator, Specific Block Panchayats, Jharkhand Fieldwork, 13 October 2017.

[22] ITW #39, Specific Person as part of the FGD, Livelihood Programme Coordinator (Rojgar Sevaks), Namkum Block, Ranchi District, Jharkhand Fieldwork on UID, 13 October 2017.

[23] An Office Memorandum No. A-11016/15/10-UIDAI, dated 17th February 2010, was issued on detailing the constitution and composition of the 'Awareness and Communication Strategy Advisory Council'. For more details, please the Office Memorandum, https://uidai.gov.in/images/resource/Media_Awareness.pdf

[24] https://uidai.gov.in/images/resource/Media_Awareness.pdf

[25] https://uidai.gov.in/images/resource/Media_Awareness.pdf

[26] The report titled 'AADHAAR – Communicating to a billion' submitted as part of the 'Awareness and Communication Strategy Advisory Council (ACSAC)' in the Section 'Components of the Communication Strategy' in Page No. 4 stated this in the second last point. The copy of this report can be accessed using The Way Back Machine of Internet Archives, for more details, please see the following archival weblink of UIDAI website as on 8 May 2011, https://web.archive.org/web/20110427224537/http://uidai.gov.in/UID_PDF/Front_Page_Articles/Events/AADHAAR_PDF.pdf

[27] For more details, please see the following archival weblink of UIDAI website as on 8 May 2011, https://web.archive.org/web/20110427224537/http://uidai.gov.in/UID_PDF/Front_Page_Articles/Events/AADHAAR_PDF.pdf

[28] ITW #23, Block Official—PDS, Khunti Block, Khunti District, Jharkhand Fieldwork on UID, 7 October 2017.

with this technology […]'.[29] Another user said, 'Nobody comes to discuss and find out our problems, no meeting or any sort of feedback is taken from us.'[30] When asked about any meeting organized by local government officials on issues related to Aadhaar, a user said, 'nobody comes to us, who cares and concerns for us, nobody bothers about people living in rural areas.'[31] Asking about the challenges with technology and delivery of welfare entitlements and how their problems are addressed, a community social worker said, 'Even after telling them (government officials) many times, it does not work, and then we try to complain to the district-head official, still things don't work much […]'.[32] While discussing with a user who seemed to be educated and aware of things when asked about whether UID officials come to understand their problem, he said, '[…] nobody comes from UID office, if any official comes from local government office they only meet and talk to the (ration) dealer. They never talk to us and try to know and understand our problems […]'.[33][36] A woman user/ beneficiary from a tribal village hamlet said, '[…] nobody comes from the government block office, or any other government office […] with UID our problems have increased, […] nobody comes to hear our grievances and feedback'.[34]

Furthermore, in trying to understand the ground-level connection of UIDAI for awareness and getting feedback from users of the system, a user who seems to be disillusioned with the biometrics-based welfare policy said, '[…] no one comes to know and hear about our problems related to the machine, fingerprint, mobile OTPs […] there is no awareness drive, neither any feedback taken from us […]'.[35] Another user who was a village representative said, '[…] every week we have a meeting of the village council, but no officials from block or district office are present […]'.[36]

Moreover, the senior official of the UID regional office, on being asked about feedback from the social loop and its importance for the system, said,

> we do awareness broadcasts on television, radio, and other places. Whenever there is a complaint about any issue, we try to act […]; we have minimal human resources […], and we do seminars and provide displays for awareness at the divisional and district level.[37]

A sense of frustration and discontent with the digital approach to development with biometrics-based access to entitlement is strongly reflected in these narratives. It reflects excessive top-down policy and design of the system, as well as centralization of power with strong technological infrastructures. Both users from rural and urban areas who depend on welfare entitlements reflected a sense of disenchantment. A constant feeling of being left out and ignored prevails. More so, it has democratic implications when technology creates new forms of selective amnesia, discrimination, and inequalities, as highlighted by many of the respondents from the rural areas—nobody bothers to come, hear, and address their problems.

Biometrics System: Feedback, Loop, and Control-colonization

The biometric system runs on automated feedback information, which is crucial for the system's operation. Automated feedback information, having both positive (successful transaction) and negative feedback information (failed transaction). However, negative feedback information, i.e., information on failed transactions not being assimilated for more extensive system course corrections or alternative changes, is crucial. It shows that though the biometric system operates in a social loop, the interaction between users and machines is not assimilated for assessing system performance and functional goals. Why should the state or the triad alliance be bothered to bring radical changes and incorporate social loops into system operation and management? The answer to this question lies in the actual purpose of the biometrics system, which is to control and colonize society, communities, and individuals by making them 'fall in line' with a digital identity and prove themselves with biometrics identification-authentication.

Assimilating social feedback information from social and spatial sites of system operation would bring critical counter-narratives and question policy choices on biometric systems and digital approaches to development. Narratives tell the other side of the story from the tales of interactional

[29] ITW #2, Focus Group Discussion (FGD), All Women Users, Specific Village, Khunti Block, Khunti District, Jharkhand Fieldwork on UID, 2 October 2017.

[30] ITW #3, FGD with Group of Beneficiaries and Former Mukhiya. Specific Village Panchayat, Khunti Block, Khunti District, Jharkhand Fieldwork on UID, 2 October 2017.

[31] ITW #4, Women Beneficiary, Specific Village Panchayat, Jharkhand Fieldwork, 2 October 2017.

[32] ITW #5, FGD with Group of Beneficiaries and Former Mukhiya. Specific Village Panchayat, Khunti Block, Khunti District, Jharkhand Fieldwork on UID, 2 October 2017.

[33] ITW #6, Beneficiary, Specific Village, Murhu Block, Khunti District, Jharkhand Fieldwork on UID, 3 October 2017.

[34] ITW #7, Beneficiary/User, Specific Village Panchayat, Murhu Block, Khunti District, Jharkhand Fieldwork on UID, 3 October 2017.

[35] ITW #8, Beneficiary, Specific Village, Murhu Block, Khunti District, Jharkhand Fieldwork on UID, 3 October 2017.

[36] ITW #12, One member in an FGD, Group of Beneficiaries of Livelihood Entitlement, Specific Village Panchayat, Torpa Block, Khunti District, Jharkhand Fieldwork on UID, 4 October 2017.

[37] ITW #42, Official, UIDAI Regional Office, Ranchi District, Jharkhand Fieldwork on UID, 17 October 2017.

encounters between users and the biometric machines. Narratives that show that despite systems' inability to achieve and deliver its goal(s) of providing access to welfare entitlements it is eulogized. The information from circular causality (loop) of the social and spatial environment is not considered, thus giving rise to critical problems and profound democratic implications. Negative feedback from both the social loop and machine loop is not being acknowledged by the state simply because the actual purpose of the biometrics system is not only for welfare but to control, colonize, and govern millions of lives on the digital terms and conditions set by the triad alliance of this empire.

The digital terms and conditions of enrolling for the 12-digit biometric digital identity and accessing entitlements only after biometrics authentication. Alternatively, if there is negative feedback regarding biometrics scans, automatic OTP delivery is provided to the registered mobile number of the concerned person. This is another term and condition for traversing it technologically. Another technological compulsion is dependent on connectivity and mobile infrastructures, and there are assumptions that people do not change their 'registered' mobile, which is generally not the case. Seeing someone try to authenticate and be unable to do so biometrically invokes a collective cultural interpretation of this digitalization-digital identity-biometrics conditionality, a defining feature for existence and survival for millions, especially in rural India. This conditionality has become compulsive and normalized with its challenges and problems. When users attempt to digitally authenticate their identity and face difficulties with biometrics or any other technological infrastructure, it generates strong social feedback information embedded in their existing social and economic positionalities. For some, it costs a whole day of wage work; for some, it is a matter of life and death due to extreme poverty and staying in hunger; for some, it is psychologically frustrating to try to prove their identity and existence continuously. Several critical narratives of users reflect a collective frustration and sadness of being in(significant) at the hands of policymakers, system builders, and bureaucratic officials. And yet, they remain at the center of focus for legitimizing technological imaginaries of modernity, development, and progress.

This digital empire with the primacy of biometrics-digital identity has brought even the poorest into digitalization. It has led to extensive digital colonization of everyday life, especially rural life. From enrolling for a digital identity to biometrics-based access for entitlement, it reflects a reality that serves the interests of the triad alliance for both control and colonization. It has become much easier for the government to filter out and exclude people if someone is out of the digital identity and biometrics-based system. Moreover, the colossal scale and projection of enrolment for digital unique identity and millions of biometrics-authentication transactions make it easier for the state, international government organizations, and market players to show 'how well the system is working.' This is projected and showcased, becoming an Indian success story. However, the actual ground reality and counter-narratives of people remain hidden and unknown. Feedback from loops of the social and spatial location of systems operation reflects a counter-narrative, where people question the very logic of digitalization with digital identity and digital accessibility of welfare entitlements. Their narratives reflect a nuanced and grounded understanding of their positionalities and the disconnect between policy approach and development planning with the excessive push for digitalization. A reality that they have lived with and traverse on an everyday basis; there is no escaping from the clutches of the digital empire and its digital colonization.

Conclusion

Feedback information from automatic biometric machines is running the engine of India's digital empire of welfare. The projection of the colossal nature of biometric transactions on an everyday basis, the state does not reflect and provide any details on failed transactions, i.e., negative feedback loops. Systemic information and the assimilation of negative feedback information are crucial for addressing its challenges. Moreover, feedback from social and spatial locations of operation of this sociotechnical system is also not considered and thought upon in any of the systems' design and technological ordering. Even negative feedback information from the social loop is never collected, assimilated, and used for systems' operational assessment and its need for welfare and development. It reflects that the state's priority as a partner in the triad alliance of (state, international development organizations, and market players) is to colonize and control its population through biometrics, digital identity, and digital access to welfare entitlements. With biometrics UID/Aadhaar, the digital empire has percolated in the veins and nerves of the country, i.e., its rural society and millions of people living in poverty. When a person enrolls for the digital identity, their life becomes a subject and object of appropriation by the triad alliance, serving each other's interests. It is unsurprising to see that feedback from both the biometric automatic loop and social loop is ignored, leading to a deep sense of frustration and disenchantment with the government, its policy approach, and the eulogy of digital development. The lack of focus on collecting, studying, and understanding feedback from social and spatial loops of this system's operation brings profound democratic implications for a highly stratified, hierarchical, and unequal society like India. These implications directly impact the everyday lives of millions due to their dependence on food, social security,

and livelihood access, making them strongly believe in—the existential compulsion and force of biometrics and the need to prove their existence constantly.

References

Almaguer-Kalixto, Patricia Eugenia, and Fabio Giglietto. 2019. Steering the world from where we are: An introduction to the sociocybernetics perspective. *Current Sociology* 67(4): 479-494.

Birnbaum, Robert. 1989. The cybernetic institution: Toward an integration of governance theories. *Higher education*: 239–253.

Cadwallader, Mervyn L. 1959. The cybernetic analysis of change in complex social organizations. *American Journal of Sociology* 65(2): 154-157.

Espejo, Raul, and Vladimir Lepskiy. 2021. An agenda for ontological cybernetics and social responsibility. *Kybernetes* 50(3): 694-710.

Von Foerster, Heinz. 1974. *Cybernetics of Cybernetics*. University of Illinois.

Forrester, Jay. 1969. *Urban Dynamics.* MIT Press.

Geyer, Felix. 1995. The challenge of sociocybernetics. *Kybernetes* 24(4): 6-32.

Geyer, Felix, and Johannes van der Zouwen. 1991. Cybernetics and social science: theories and research in sociocybernetics. *Kybernetes* 20(6): 81-92.

Heims, Steve J. 1991. *The cybernetics group*. MIT Press.

Jonas, Hans. 1953. A critique of cybernetics. *Social Research*: 172–192.

Parsons, Talcott, Robert F. Bales, and Edward Shils. 1953. *Working papers in the theory of action*. Free Press.

Scott, Bernard. 2008. Working with Gordon Pask (1967–1978): Developing and applying conversation theory. In *Handbook of conversation design for instructional applications:* 19–34. IGI Global.

Tomas, David. 1995. Feedback and Cybernetics: Reimaging the Body in the Age of the Cyborg. *Body & Society* 1(3-4): 21-43.

Wiener, Norbert. 1948. *Cybernetics, or the study of control and communication in animal and the machine*. Cambridge, MA: MIT University Press.

Wiener, Norbert. 1954. *The human use of human beings: Cybernetics and society*. Houghton Mifflin.