



Journal Homepage: [-www.journalijar.com](http://www.journalijar.com)

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI:10.21474/IJAR01/23367
DOI URL: <http://dx.doi.org/10.21474/IJAR01/23367>



RESEARCH ARTICLE

DISINTERMEDIATION BY FUNCTION: DIGITAL PUBLIC INFRASTRUCTURE AND THE SELECTIVE PERSISTENCE OF WELFARE MEDIATION IN INDIA

Faheem Abdul Muneeb

1. Research Scholar at Vikrant University.

Manuscript Info

Manuscript History

Received: 09 May 2026

Final Accepted: 11 June 2026

Published: July 2026

Key words:-

Digital public infrastructure; digital governance; administrative discretion; welfare delivery; disintermediation; administrative burden; algorithmic governance; Aadhaar; MGNREGA; India

Abstract

India's Digital Public Infrastructure — Aadhaar, Direct Benefit Transfer, and the payment rails built around them — promised to move welfare directly from the state to the poor, removing the officials and agents who stood between them. The evidence is contradictory: some studies find that digital systems cut leakage and improved delivery, while others find that intermediaries endured and new exclusions opened. This article treats that disagreement as a problem of aggregation. Welfare delivery bundles distinct operations — establishing eligibility, verifying identity, disbursing benefits, cashing them out, and resolving failures — that respond to digitalisation differently. Drawing on MGNREGA wage payments and Aadhaar authentication in the Public Distribution System, it develops a functional account resting on two properties: a function's administrative computability, which governs whether it can pass from human hands to a system, and the design of its failure-handling, which governs what automation does once the system breaks down. The same authentication technology improved delivery in one state yet cut between 1.5 and 2 million people off from their rations in another — a divergence explained by failure design, not by technology. Digitalisation, on this account, does not abolish mediation but redistributes it: across administrative functions, and towards those who design the rules. The argument reconciles two literatures that appear to contradict one another and specifies where the design of digital welfare most needs attention if it is to preserve access rather than merely secure savings.

"© 2026 by the Author(s). Published by IJAR under CC BY 4.0. Unrestricted use allowed with credit to the author."

Introduction:-

The case for routing India's welfare payments through digital systems was made in the language of removal. When the central government expanded Direct Benefit Transfer from 2013, the promise was that money would move from the treasury to the beneficiary without passing through the officials whose handling of it had produced delay, diversion, and arbitrary gatekeeping (Ministry of Finance, 2013). Aadhaar carried a related promise: a unique biometric identifier would let the state recognise a resident directly, dispensing with the intermediary vouching that had long governed access to public goods (Aiyar, 2017). The ambition drew on an older idea that legible, standardised identification lets a state deal with its citizens without local go-betweens (Scott, 1998). Packaged with

the payment interfaces layered on top of these foundations, the resulting Digital Public Infrastructure (DPI) was described as substituting an unmediated relationship between state and citizen for a mediated one.

By Digital Public Infrastructure this article means the specific Indian assemblage sometimes branded the “India Stack” and popularised through the “JAM trinity” of Jan Dhan bank accounts, Aadhaar identity, and mobile connectivity: a set of interoperable, population-scale digital rails for identity, payments, and data on which welfare and other services are built (International Monetary Fund, 2023). The term is used here in this concrete, architectural sense rather than as a generic category of e-government, and the analysis concerns only those elements of the stack that touch welfare delivery — Aadhaar authentication, Aadhaar-seeded bank accounts, and the DBT payment rails — not the whole of the ecosystem.

Whether this infrastructure has delivered directness is contested in a way that is initially hard to reconcile. A large experimental literature reports that biometric and electronic payment systems reduced the leakage of funds and reached beneficiaries more reliably than the arrangements they replaced (Muralidharan et al., 2016). Official assessments go further, attributing cumulative fiscal savings on the order of ₹3.5 lakh crore between 2014 and 2024 to the deletion of duplicate and “ghost” beneficiaries enabled by Aadhaar seeding (Government of India, 2025). A substantial body of survey and ethnographic work reports the opposite. Drèze and colleagues (2017) found that biometric authentication failed for the people least able to withstand it and opened new points of exclusion; Chaudhuri (2019) showed that local agents remained indispensable rather than disappearing; and Masiero and Das (2019) argued that datafying an anti-poverty programme introduces its own legal and informational injustices. The same critical literature disputes the savings figures, arguing that headline numbers conflate genuine leakage reduction with the exclusion of eligible beneficiaries and with unrelated price effects (Drèze&Khera, 2018). Both literatures are careful, and both describe the same infrastructure.

That two well-executed research programmes should reach opposing verdicts is worth pausing over, because the difficulty may lie less in the evidence than in the unit to which it is applied. Welfare delivery is not a single act that is either mediated or not. It is a sequence of operations that happen to be bundled together: establishing who qualifies, confirming that a claimant is the person entitled, computing and moving the benefit, converting that benefit into cash or grain at the point of collection, and dealing with the failures that arise along the way. These operations differ in kind. Some turn on interpreting ambiguous evidence; others amount to applying a fixed rule to a verifiable fact. Because they differ in this respect, a digital system built to serve all of them touches each differently — displacing an intermediary here, leaving one in place there, and generating a new one somewhere else. Accounts that speak of disintermediation at the level of the programme rather than the operation flatten this variation, and end up describing different parts of the same process while appearing to contradict one another.

This article therefore shifts the unit of analysis from the programme or the technology to the administrative function. Where existing scholarship has largely asked whether digitalisation, taken as a whole, reduces leakage, improves access, or reproduces exclusion, this article asks a more disaggregated question: which operations within welfare delivery does digitalisation displace, which does it leave intact, and what governs the difference?

Answering that question requires a working vocabulary for mediation and a criterion for deciding when it has genuinely been displaced rather than merely relocated. Mediation here means the institutional layer that stands between a citizen's claim and its satisfaction — the actors, offices, and procedures through which a person obtains a service. The definition is deliberately neutral: an intermediary is not by definition an obstacle. Gupta (2012) shows how routine dealings with an indifferent or predatory bureaucracy can operate as a form of structural violence, so that the intermediary is often the barrier; yet Corbridge and colleagues (2005) show that mediation is also how the poor reach the state at all, so that removing it can strip away a channel of redress along with a source of extraction. Three forms of mediation can be distinguished. Human intermediation exists where a specific person stands between citizen and benefit and exercises judgment over access — the dealer, the panchayat official, the banking agent. Institutional mediation exists where an office or procedure, rather than a nameable person, governs a claim. Technical mediation exists where a device, database, or authentication system performs a function a human once performed. On this vocabulary an operation is genuinely disintermediated only when human intermediation over it is removed and not reconstituted as an equivalent human choke-point elsewhere.

Two properties of an operation, developed through the cases that follow, govern what digitalisation does to it. The first is its *administrative computability*: the degree to which its output can be generated from specified and verifiable inputs without contextual judgment, under the data and rules that actually obtain. This is a property of an operation within a given administrative order, not a claim about the ultimate reach of computation, and it is a matter of degree

— confirming that a fingerprint matches an enrolled record sits at the computable end, while deciding whether a household's fluctuating informal income falls below a threshold sits far from it. Administrative computability governs whether an operation can move from human hands to a system at all. The second property is the *design of its failure-handling*. Even a highly computable operation fails part of the time — a fingerprint does not read, a record is missing, a network is down — and what the system does at that point is a matter of design rather than of technology. Where failure meets an override, an alternative, or a working grievance channel, access is preserved and the cost is absorbed by the state; where it does not, failure resolves into exclusion and the cost falls on the beneficiary. Failure design governs what automation does once the operation breaks down.

That these two properties, rather than the technology, do the explanatory work follows from a well-established finding about what encoding decisions in software does to discretion. Lipsky (1980) showed that officials at the point of service cannot avoid judgment, because the rules they administer cannot anticipate every configuration a real applicant presents; Maynard-Moody and Musheno (2003) showed that such officials act less as rule-appliers than as citizen-agents forming normative judgments about deservingness. Bovensand Zouridis (2002) traced what happens to that judgment when decisions move into code: discretion does not vanish but migrates upstream, from the official at the counter to the analysts and designers who fix what the system will and will not recognise. A now-substantial literature on digital discretion has confirmed and extended this pattern (Busch & Henriksen, 2018). The present article does not rediscover the migration of discretion; it takes it as established, and adds that the migration is selective — complete for some operations, stalled for others — and that whether a displaced operation returns as exclusion depends on how the architecture treats the cases it cannot fit.

Two Indian cases are used to develop and probe this account. Wage payment under the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) layered electronic transfer onto a scheme whose allocation and verification stayed in official hands. Aadhaar-based authentication in the Public Distribution System (PDS) introduced a biometric check at the point where households collect subsidised food. In each, one infrastructure meets several operations and its effect is uneven: it removes mediation from some, leaves it untouched in others, and, in a third, converts a visible and negotiable human intermediary into an opaque technical one. The cases also expose the pivotal fact this article sets out to explain. The research team that documented large gains from biometric payments in Andhra Pradesh (Muralidharan et al., 2016) later evaluated Aadhaar-based authentication in the Jharkhand PDS and found that, while corruption again fell, between 1.5 and 2 million legitimate beneficiaries lost access to their entitlements at some point during the reform (Muralidharan et al., 2025). The same technology, competently studied by the same researchers, improved delivery in one setting and produced large-scale exclusion in another. The explanation cannot lie in the technology or in the quality of the research; it must lie in what the systems were asked to do and in how they were built to behave when they failed.

The design is a theory-building comparison. MGNREGA and the PDS were selected not for statistical representativeness but for analytical contrast: both are large, nationally significant programmes that historically delivered benefits through a concentrated local intermediary and have since been subjected to the same national identity and payment stack, yet they foreground different mixes of administrative function — MGNREGA the payment and last-mile operations, the PDS identity authentication and, at one remove, eligibility. If one taxonomy of operations, applied to two dissimilar programmes, sorts their functions in the same way, that consistency is evidence that the taxonomy tracks a real property rather than an artefact of a single case. The analysis draws on four kinds of secondary evidence, deliberately spanning methods and viewpoints so that the argument rests on no single tradition: randomised and natural experiments on payment and authentication reforms; large household and representative surveys of PDS authentication and Aadhaar exclusion; administrative-data and transaction-level studies of payment delay and last-mile access; and ethnographic and information-systems research on intermediation and datafication. Official evaluations and their published critiques are both included, so that the strongest claim of each camp is represented rather than filtered. The cases are asked to do analytical rather than representative work, and the framework is offered to be tested elsewhere.

The article makes three contributions. First, it proposes the administrative function as the appropriate unit of analysis for studying welfare disintermediation, and shows that disaggregating delivery into distinct operations dissolves much of the apparent conflict in the literature. Second, it distinguishes the two properties — administrative computability and the design of failure-handling — that jointly condition the effect of digitalising any given operation. Third, it uses that distinction to explain the fact that neither the disintermediation reading nor the persistence reading can account for on its own: that one authentication technology improved delivery under one implementation and excluded roughly two million people under another. The argument deliberately limits its scope.

It does not hold that eligibility, or any function, is permanently beyond automation; that is an open empirical question the present evidence cannot settle. Nor does it extend to the electoral or representational effects of digital welfare, for which the required evidence does not exist. What the two cases support is a more exact account of a familiar phenomenon: an explanation of why the disintermediation reading and the persistence reading are both, within their domains, correct, and an identification of the conditions that decide which reading applies where.

The argument proceeds as follows. The next section reconstructs the pre-digital architecture of the two programmes, so that the effect of digital systems can be located within it rather than described in the aggregate. The two sections that follow examine, in turn, the digitisation of the MGNREGA payment rail and Aadhaar authentication in the PDS. A comparative section then reads the two cases function by function and sets the evidence out systematically. A discussion section answers the strongest objections and marks the limits of the claim, and a short conclusion draws out what the account implies for the relationship between the state and the citizen.

The pre-digital architecture of welfare delivery:-

Before digitalisation, both programmes delivered benefits through a set of operations concentrated in local hands, and reconstructing that architecture allows the effect of digital systems to be located within it rather than described in the aggregate.

MGNREGA, enacted in 2005 to guarantee up to a hundred days of wage employment a year to every rural household that seeks it (Mahatma Gandhi National Rural Employment Guarantee Act, 2005), ran from registration to payment through a single apparatus. A worker registered with the gram panchayat; panchayat and block officials identified and sanctioned worksites; officials verified the work at the site; wages were computed from the record; and the wage was paid, historically through post offices, banks, or cash at the worksite. The operations were integrated, and this is what mattered politically: the local authority that allocated work also verified it and controlled its payment, so that power over the wage was continuous with power over access. Payment could be delayed to discourage further claims, inflated for favoured workers, or withheld from opponents, functioning as an instrument of a local political economy of employment rather than as a discrete administrative step (Muralidharan et al., 2016).

The PDS delivered subsidised food through a parallel concentration. Eligible households, identified against state criteria, held a ration card; at the fair-price shop the dealer confirmed the cardholder's identity, recorded the transaction, and issued the monthly entitlement. Here too a single actor determined, in practice, whether a claimant would be recognised, how strictly quantities would be honoured, and whether the records matched what was actually given. That concentration produced two characteristic diversions: siphoning against the names of people who received nothing, and quantity cuts skimmed from those who received something (Drèze et al., 2017).

Both programmes, then, bundled eligibility determination, identity verification, benefit computation, last-mile delivery, and grievance-handling into one mediating layer of concentrated human intermediation. Digitalisation did not replace that layer as a whole. It entered at particular points within it, and the task is to see which operations it reached, which it left in place, and what became of the people who had performed them.

MGNREGA: the payment rail:-

The change that DBT brought to MGNREGA was, at bottom, a change to one operation. Once work is verified and a wage computed, an electronic Fund Transfer Order moves the amount from the treasury toward the worker's bank account; Aadhaar-based payment routing later standardised this, directing the credit to whichever account is mapped to the worker's Aadhaar number. The verification of work and the allocation of it were untouched. The predetermined wage now travels along a digital rail rather than through an official's hands — a displacement of technical for human handling at exactly one point in the sequence.

Where that rail is implemented well, the gains are genuine, and it would misrepresent the evidence to minimise them. The randomised evaluation of biometric Smartcards in undivided Andhra Pradesh remains the clearest demonstration: across 157 sub-districts and some nineteen million people, the reform produced a faster, more predictable, and less corrupt payment process, cutting leakage in the scheme by about 41 percent relative to the control group without reducing access, and generating time savings to workers that alone matched the intervention's cost (Muralidharan et al., 2016). Beneficiaries preferred the new system to the old. On the disintermediation reading this is the paradigm case: the officials whose discretion had enabled diversion were disciplined by a payment process that recorded who was paid and made skimming harder.

One feature of that result complicates the vocabulary of removal, and it deserves to be elevated from an empirical footnote to an analytical point. The Andhra Pradesh gains came not from eliminating the human intermediary but from redesigning it: locally hired, bank-employed agents authenticated beneficiaries biometrically and paid them in cash in the village (Muralidharan et al., 2016). What improved payment was a more accountable mediator, not the absence of one. This suggests a general possibility the disintermediation vocabulary obscures — that digitalisation may improve delivery less by removing human intermediation than by reconstituting it in a more accountable form, automating only the record and the transfer behind it. The national model that followed took the opposite tack, dropping the in-village agent and directing beneficiaries to banks and banking correspondents, and its record is correspondingly uneven. The strongest single piece of evidence for disintermediation, in other words, in fact involved a redesigned intermediary, and the move to a thinner human layer at the last mile did not straightforwardly improve on it.

At national scale, the claim that electronic transfer made payment prompt does not hold. Analysing roughly nine million transactions across ten states for 2016–17, Narayanan and colleagues (2019) found that only about one payment in five was completed within the mandated fifteen days once the full cycle was counted. Their contribution was to separate the two legs of the transfer — the state's generation of the payment order, and the central government's subsequent release of funds — and to show that official figures, by measuring only the first, understated delay substantially. On their account, delay is driven less by the payment technology than by the flow of funds behind it: where budgets are short, the rail cannot move money that has not been released. This is an institutional failure rather than a technical one, and it is largely independent of the digital rail itself; both the Ministry of Finance and the Supreme Court have acknowledged the problem (Narayanan et al., 2019).

The rail delivers money to an account, not to a hand, and the account must still be reached. Across much of rural India this last mile runs through banking correspondents and common service centres, and the passage is neither quick nor dependable. A multi-state study found that roughly four to five percent of wage transactions were rejected outright, that workers in Jharkhand and Rajasthan spent on the order of four to five hours obtaining their wages against about an hour in Andhra Pradesh, and that the large majority of grievances went unresolved (LibTech India, 2020). Aadhaar-based routing introduced failures of its own: transfers rejected because an Aadhaar number was not correctly seeded, and transfers misdirected to another person's account through mapping errors that are difficult to detect and harder to reverse (Narayanan et al., 2019). When Aadhaar-based payment was made effectively the default for wage disbursement, the accompanying churn of account mapping coincided with the deletion of large numbers of workers from the rolls, a share of them wrongly, prompting protest and judicial attention (LibTech India, 2024).

Set against the pre-digital architecture, the pattern sorts by operation. The disbursement rail has been genuinely digitalised, and where funds are released it improves on the discretionary, delay-prone distribution it replaced. Work allocation and verification have not been automated at all and remain with panchayats and block officials, because deciding which projects to sanction and confirming that earthwork was actually done are judgments entangled with local interests rather than computations over verifiable inputs — operations low in administrative computability. The last mile has not been disintermediated so much as re-intermediated: the post office and the worksite paymaster have given way to banking correspondents and service centres, private actors with their own incentives and widely varying reliability. And grievance-handling has become a more salient and worse-performing operation, as the failures thrown up by the rail and the routing generate problems the system is ill-equipped to resolve. The image of money passing directly from treasury to citizen describes one operation accurately and the operations around it not at all.

Aadhaar and the PDS: identity without eligibility:-

If MGNREGA shows the payment rail coming apart from the operations around it, Aadhaar in the PDS shows two operations that are habitually conflated — verifying identity and determining eligibility — behaving in opposite ways. Aadhaar, launched in 2009 and covering more than 1.2 billion residents within a decade (Abraham et al., 2018), assigns a unique identifier tied to biometric and demographic records; the system now processes tens of billions of authentication transactions a year. It has entered the PDS at two points: the seeding of ration cards to Aadhaar numbers, and the authentication of the cardholder at the shop, where collecting the monthly ration now typically requires a fingerprint match on a point-of-sale device. For the authentication operation, this is genuine disintermediation, and it should be named as such. Confirming that the person at the counter is the enrolled cardholder is a matter of matching a biometric to a record — a computation that needs no human judgment, an operation high in administrative computability. Where the machinery works, the dealer's former role in vouching for

or disputing a claimant's identity is simply gone; the device performs it. The identity check that a frontline worker once exercised has, in the terms Bovens and Zouridis (2002) made familiar, left their hands. Among all the operations in either case, this is the clearest instance of a human function displaced into technical mediation rather than merely relocated.

Eligibility is a different matter, and in the cases examined Aadhaar does not automate it. Deciding whether a household meets the income, residence, and composition criteria for subsidised food requires interpreting evidence that is often informal, irregular, or inconsistent across sources — an operation low in administrative computability. Aadhaar de-duplicates identity and blocks one person from holding two entitlements; it does not compute deservingness. This limit is not merely observed by critics but built into the architecture: the JAM infrastructure was not designed to verify the socio-economic data on which eligibility rests, and the assessment of eligibility criteria continues to be performed by scheme administrators against their own databases (International Monetary Fund, 2023). Masiero and Das (2019) draw the same line from the other side, distinguishing the system's capacity to recognise a beneficiary from its capacity to assign an entitlement, and locating the harder problems in the latter. What digitalisation changes is the manner of the eligibility judgment, not its necessity: where an official once weighed paper documents face to face, the determination now runs through the cross-referencing of digital records, and the discretion involved shifts to those who decide which databases are consulted, how conflicts among them are read, and what is done when a record is missing. The judgment persists, relocated from the counter to the console — a redistribution of mediation rather than its removal.

The most instructive evidence concerns the authentication operation whose computability seemed to promise a clean displacement, and it shows that computability conditions less than one might expect. The largest evaluation, covering some fifteen million beneficiaries in Jharkhand, found that mandatory biometric authentication in the PDS did reduce corruption, but that between 1.5 and 2 million legitimate beneficiaries lost access to their rations at some point during the reforms (Muralidharan et al., 2025). The authors' interpretation carries as much weight as the number: the adverse effects were driven primarily by decisions about how the transition was managed rather than by the technology, and the contrast with their Andhra Pradesh results reflected differences in programme design and emphasis — Andhra Pradesh's rules aimed to improve the beneficiary's experience, Jharkhand's to secure fiscal savings — rather than differences in state capacity (Muralidharan et al., 2025). The same authentication technology improved delivery under one design and excluded millions under another.

This is where the design of failure-handling becomes decisive, and it is worth being precise about what fails and how a system may respond. Failures in these systems are of several kinds: technical, where a device, biometric, or network does not perform; data, where records are missing, mismatched, or wrongly mapped; institutional, where the surrounding administrative machinery does not deliver; and procedural, where no exception or alternative route exists for cases the system cannot process. The institutional response can be arrayed along a single dimension. At one pole is a closed failure system: when authentication fails there is no override, no accessible alternative, and no effective recourse, so failure resolves into exclusion and its cost falls on the beneficiary. At the other is a recoverable failure system: a failed match can be met with an alternative verification, a human override, an offline fallback, or a working grievance channel, so that access is preserved and the cost is absorbed by the state. In these terms the Andhra Pradesh design, with its in-village agents and its orientation to the beneficiary's experience, approximated a recoverable system, while the Jharkhand rollout — faster, oriented to fiscal savings, and with the available offline fallback left underused — approximated a closed one. The divergence in outcomes tracks the divergence in failure design, holding the technology constant.

Independent survey research points the same way while weighting the costs more heavily. Surveying households across villages in Jharkhand, Drèze and colleagues (2017) found that biometric authentication raised exclusion and transaction costs for the most vulnerable — the elderly, manual labourers, those whose fingerprints no longer read cleanly — while failing to reach the quantity cuts that made up much of the diversion, since skimming from a genuine transaction is invisible to an identity check. Exclusion of this kind appeared even in Hyderabad, where connectivity and administration were comparatively favourable (Somanchi et al., 2017). A three-state representative survey attributed between 0.8 and 2.2 percent of PDS exclusion to Aadhaar-related failures — a share that in those states corresponds to roughly two million people, a separate estimate from the Jharkhand figure though of similar magnitude — even as overall satisfaction with Aadhaar remained high (Abraham et al., 2018). Tellingly, the offline authentication that might have reduced such failures went underused (Dalberg, 2019), which is to say that a recoverable design was available and not adopted. That scholars disagree over whether the leakage Jharkhand's

reform reduced justified the exclusion it caused (Drèze et al., 2020) is itself evidence for the larger argument, since the two sides are weighing the same real and offsetting effects, and the balance between them is set by design.

What makes authentication failure consequential is not only its frequency but its effect on the citizen's position. A dealer who refused a claimant face to face could be argued with, appealed to, or reported to an elected representative; that mediation, whatever its faults, was visible and could be worked on. When the point-of-sale device declines to authenticate and the dealer can say only that the system has refused, the same denial becomes opaque and non-negotiable. Fox (2007) draws the distinction that the cases repeatedly bear out — that transparency is not accountability, since knowing a denial has occurred yields no remedy unless some actor can be made to correct it — and a coded refusal offers no obvious equivalent of the hearing, the explanation, or the appeal that once attached to a discretionary decision (Citron, 2008). The exclusion Peeters and Widlak (2018) attribute to information architecture is exactly this: a person whose biometric will not read, or whose seeding is wrong, is turned away by the design rather than by a decision, and unless the design provides an exception path there is no one to persuade. The work of resolving the failure — the return visits, the re-enrolment, the travel — then falls as an administrative burden on the person least able to bear it (Herd & Moynihan, 2018). Authentication, the operation that looked most cleanly automatable, regenerates mediation precisely at the point of its failure, and how much failure it generates is set by whoever writes the rules for exceptions.

Comparing the two cases:-

Read together, the two cases yield a consistent pattern that neither the disintermediation reading nor the persistence reading captures alone. Table 1 sets out the five operations across both programmes along the two properties developed above; Table 2 arrays the principal evidence by case, method, and outcome, so that the empirical basis for the pattern is visible in one place.

Table 1. How digitalisation affects distinct welfare functions

Function	Computability	What digitalisation did	Effect on mediation	Main failure mode	Who bears the cost
Eligibility	Low	Paper checks replaced by record cross-checking	Persists; discretion moves upstream to record-holders	Data: missing or wrong records; ambiguous cases	Applicant, via delay or denial
Authentication	High	Biometric match replaces human vouching	Displaced where it works; returns when it fails	Technical / data: mismatch, connectivity, seeding	Beneficiary, via return visits or exclusion
Payment	High	Computed wage routed via electronic transfer	Reduced where funds are released	Institutional / data: fund-release delay; misrouted transfers	Worker, via delayed or withheld wages
Last-mile access	Low–medium	Cash-out shifted to agents and centres	Re-intermediated to private agents	Institutional: distance, agent liquidity	Beneficiary, via time, travel, cost
Grievance	Low	Digital records and formal complaint channels	Newly salient but weakly embedded	Procedural: no override; unresolved complaints	Beneficiary, via unremedied loss

Note. “Computability” denotes administrative computability: the degree to which an operation yields an administratively valid decision from specified and verifiable inputs without contextual judgment. Failure modes follow the typology set out above (technical, data, institutional, procedural).

Table 2. Principal evidence by case, method, and outcome

Case and function	Intervention	Method	Reported outcome	Resulting mediation
Andhra Pradesh NREGS — payment	Biometric Smartcards with in-village agents	Randomised evaluation	Leakage down ~41%; faster payment; time savings; beneficiaries preferred it	Redesigned, more accountable human agent
National MGNREGA — payment	DBT and Aadhaar-based routing	Administrative-data / transaction study	~1 in 5 payments within 15 days once full cycle counted; delay driven by fund release	Institutional and technical
National MGNREGA — last mile	Banking correspondents and service centres	Multi-state field study	~4–5% transactions rejected; 4–5 hours to obtain wages in some states; most grievances unresolved	Re-intermediated to private agents
Jharkhand PDS — authentication	Aadhaar-based biometric authentication	Randomised and natural experiments	Corruption down; 1.5–2 million lost access at some point during reforms	Technical, closed failure design
Jharkhand PDS — authentication	Aadhaar-based biometric authentication	Household survey	Exclusion and transaction costs concentrated on the most vulnerable; quantity fraud untouched	Technical plus shifted citizen burden
Three-state PDS — authentication	Aadhaar seeding and authentication	Representative survey	0.8–2.2% of exclusion attributable to Aadhaar failures (~2 million people); offline mode underused	Technical, avoidable with fallback

Note. Sources as cited in the two case sections above. The two “roughly two million” figures — the Jharkhand PDS exclusion (Muralidharan et al., 2025) and the three-state survey estimate (Abraham et al., 2018) — are distinct estimates of similar magnitude, not the same population counted twice.

Two operations anchor the extremes. Benefit disbursement — computing and moving a determined amount — is administratively computable, and where the conditions behind it hold it is automated and human intermediation over it is displaced; this is the truth in the disintermediation reading. Eligibility determination, in the cases examined, is not computable in this sense; it rests on interpreting ambiguous evidence, so its mediation persists and migrates to those who control the records; this is the truth in the persistence reading. The two readings are observations about different operations, and once the operations are separated the appearance of contradiction largely dissolves. Proponents who point to direct payment and critics who point to continuing gatekeeping are, for the most part, both right, because they are describing operations at opposite ends of the computability continuum.

The cases also identify what conditions the outcome where computability alone is silent. Computability governs whether an operation can move to the system level: disbursement can, eligibility cannot. But among operations that can, the design of failure-handling governs what automation actually does. Authentication isolates this second condition cleanly, because it is computable in principle yet produced improved delivery in Andhra Pradesh and the exclusion of some two million people in Jharkhand, with the difference lying in the protocols governing the transition and the treatment of failures rather than in the technology or in state capacity (Muralidharan et al., 2025). A computable operation is not thereby a benign one; whether its automation serves beneficiaries or excludes them turns on whether exceptions can be made, whether recourse exists, and who is made to carry the cost when the match fails.

Failure-handling is one condition among several, not a master variable. Fund flow governs whether the disbursement rail delivers on time, independent of any failure design (Narayanan et al., 2019); the density of banking and the reliability of agents govern the last mile. What the cases establish is narrower and more useful than a general theory:

that the effect of digitalising a computable operation cannot be read off its computability, and that the institutional handling of failure is a decisive part of the difference.

The through-line across both programmes is that mediation is seldom removed cleanly. It is redesigned into a more accountable agent, as in Andhra Pradesh; passed to a private correspondent at the last mile; shifted upstream to those who write the decision logic, as with eligibility; or folded into the system itself, as with authentication failure. This is consistent with the migration of discretion that Bovens and Zouridis (2002) describe, with the reorganisation of the state around information infrastructures that the digital-era-governance literature identifies (Dunleavy et al., 2006), and with the accounts of algorithmic governance in which ranking, scoring, and matching become instruments of social ordering (Katzenbach & Ulbricht, 2019); others trace the same computational turn into the construction of public value (Andrews, 2019). It matches Chaudhuri's (2019) finding of intermediation reproduced within Aadhaar, and it sits alongside the warning that a digital welfare state risks becoming an apparatus of surveillance and control (Alston, 2019) and the documentation of automated systems that discipline rather than serve the poor (Eubanks, 2018). The contribution here is to specify what those general claims leave open: which operations the migration completes, which it stalls, and the design conditions under which a displaced operation returns as exclusion.

Discussion: Gains, Objections, and Limits:-

Because the pattern is consistent across two very different programmes, it is worth meeting the strongest objections directly before marking the boundaries of the claim.

The first objection is that this is ordinary electronic government — that relocating administrative work into systems is a general feature of computerised bureaucracy and nothing specific to Indian welfare. The mechanism is indeed general, and the article claims no more; it is the same migration of discretion that the digital-era-governance literature describes (Dunleavy et al., 2006), and the same redistribution of authority among officials, systems, and vendors that the algorithmic-governance literature treats as a mode of regulation (Yeung, 2018). The value of the account lies in disaggregating that mechanism by operation, in adding failure-handling as a second condition, and in doing so where the stakes of a failed transaction are subsistence rather than inconvenience. That the mechanism is general is a reason to credit the account, not to set it aside.

A second objection holds that persistent mediation is a transitional problem of implementation that maturing systems will dissolve. The possibility cannot be excluded, and the leading experimental evidence cuts in a particular direction here: the Jharkhand exclusions are attributed to how the reform was managed rather than to the technology (Muralidharan et al., 2025). That finding supports rather than undermines the argument, because the claim is not that eligibility mediation is permanent but that outcomes across operations are conditioned by computability and by failure design — and if exclusion is an implementation artefact, then failure design is precisely the variable in question. What the article declines to assert is the stronger structural claim that any operation is necessarily and forever beyond automation, which would require longitudinal comparison of high- and low-capacity systems over time that the present evidence does not provide. This is why the article speaks of administrative computability under the arrangements that obtain, and treats eligibility's resistance as a feature of the cases examined rather than a law.

A third objection runs the other way — that digital systems eliminate more mediation than an emphasis on persistence allows. This should be granted without reservation. The reductions in leakage and in fictitious beneficiaries documented in the Andhra Pradesh experiment are real and substantial (Muralidharan et al., 2016), the Jharkhand reform reduced corruption even as it excluded (Muralidharan et al., 2025), and even the contested official savings figures likely capture some genuine reduction in diversion (Government of India, 2025). Any fair account registers these gains alongside the exclusions. The claim is not that digitalisation fails but that its effects are operation-specific and design-contingent, which is fully compatible with real gains in some operations and serious costs in others.

A fourth objection is that intermediaries persist because of weak state capacity rather than anything about the operations themselves. Capacity plainly matters, but the sharpest available evidence attributes the Andhra Pradesh–Jharkhand divergence to programme design and emphasis rather than to capacity (Muralidharan et al., 2025), and even under high capacity the eligibility judgment remains a judgment. Architectural exclusion is not a pathology of poor administrations alone: Peeters and Widlak (2018) document it in a wealthy state's civil registry, and Eubanks (2018) documents automated eligibility and data-matching regimes profiling the poor in another. Capacity and design both shape outcomes; the operational structure of delivery organises the space within which they do so.

These arguments converge on a practical point that the disintermediation debate has tended to miss. If the outcome of automating a computable operation is set less by the technology than by the handling of its failures, then the design questions that decide whether digital welfare preserves access or merely secures savings are specifiable in advance: whether an accessible offline or alternative-verification path exists when a biometric will not read; whether a human override is available, and someone is authorised and accountable for exercising it; whether a funded, answerable grievance channel attaches to the point of failure; and who is made to bear the cost — return visits, re-enrolment, travel — when the system cannot process a case. The Andhra Pradesh and Jharkhand implementations of one authentication technology differed on precisely these dimensions, and so did their outcomes. Reform effort is better spent here, on the architecture of failure, than on the prior and largely settled question of whether a computable operation should be automated at all.

Three boundaries of the argument should be equally plain. First, it rests on two programmes and on secondary evidence concentrated in a handful of states, and does not survey the whole of India's welfare architecture; the functional taxonomy is offered as a framework to be tested elsewhere, not as an established generalisation. Second, it is silent, by design, on questions that administrative evidence cannot answer — whether digital welfare has altered patronage, brokerage, or electoral competition — which would require political-economy research not attempted here, and which the literature on how the poor select and use brokers suggests are not settled by administrative disintermediation alone (Auerbach&Thachil, 2018). Third, the beneficiary's own experience of these systems — how directness is perceived, whom people turn to when the device refuses — remains thin relative to the transaction-level metrics on which official evaluation concentrates, and the framework would be sharpened by qualitative work at that register. Marking these boundaries is part of keeping the claim defensible.

Conclusion:-

India's Digital Public Infrastructure has not replaced a mediated welfare state with an unmediated one, and it has not left the old arrangements in place. It has acted on welfare delivery operation by operation: automating the disbursement rail where funds are released, leaving the eligibility judgment intact while moving it from the counter to the console, and displacing the verification of identity while generating, at the point where verification fails, a newer and less answerable form of exclusion. Mediation proves durable across both cases. What digitalisation changes is where mediation sits and who exercises it — a redesigned agent, a private correspondent, the designers of the decision logic, or the system itself.

The organising finding is therefore not that mediation persists but that it is redistributed: across administrative functions, according to their computability, and across institutional locations, according to the design of failure. And whether automating a computable operation helps beneficiaries or excludes them is conditioned less by the technology than by the way the system is built to handle its own failures, as the divergence between two implementations of one authentication technology makes plain.

The significance of this for the relationship between the state and the citizen is narrower than the language of digital transformation implies, and steadier for being narrow. What changes when mediation is redistributed in these ways is its visibility and its contestability. A denial that could once be argued with becomes one that cannot; discretion that could be located in a person moves to a system whose logic is set elsewhere; and the effort of coping with failure passes from the state to the citizen, weighing most on those with the least capacity to absorb it. These are consequences for administrative access, responsiveness, and recourse — for the texture of state-citizen relations at the point of delivery — not for representation or electoral politics, on which the evidence here is silent. They imply that the useful question for reform is not whether mediation persists, since in some operations it must, but whether the mediation that persists stays visible to the people it governs and open to their challenge.

The framework is offered as a tool rather than a verdict. Existing scholarship has shown both that digital systems can disintermediate welfare and that intermediaries endure; the apparent conflict between these findings largely resolves once welfare delivery is disaggregated into its constituent operations, which differ in their administrative computability and in the design of their failure-handling. Seeing which operations digitalisation displaces, which it leaves intact, and why comparable instruments improve delivery in one place and exclude in another does not overturn the existing accounts. It explains how both can be true at once — and it points to where the design of digital welfare, if it is to preserve access rather than merely secure savings, most needs attention: not in the choice to automate a computable operation, but in what the system is built to do when that operation fails.

References:-

1. Abraham, R., Bennett, E. S., Sen, N., & Shah, N. B. (2018). State of Aadhaar report 2017–18. IDinsight.
2. Aiyar, S. (2017). Aadhaar: A biometric history of India's 12-digit revolution. Westland.
3. Alston, P. (2019). Report of the Special Rapporteur on extreme poverty and human rights: Digital welfare states and human rights (UN Doc. A/74/493). United Nations General Assembly.
4. Andrews, L. (2019). Public administration, public leadership and the construction of public value in the age of the algorithm and 'big data'. *Public Administration*, 97(2), 296–310.
5. Auerbach, A. M., & Thachil, T. (2018). How clients select brokers: Competition and choice in India's slums. *American Political Science Review*, 112(4), 775–791.
6. Bovens, M., & Zouridis, S. (2002). From street-level to system-level bureaucracies: How information and communication technology is transforming administrative discretion and constitutional control. *Public Administration Review*, 62(2), 174–184.
7. Busch, P. A., & Henriksen, H. Z. (2018). Digital discretion: A systematic literature review of ICT and street-level discretion. *Information Polity*, 23(1), 3–28.
8. Chaudhuri, B. (2019). Paradoxes of intermediation in Aadhaar: Human making of a digital infrastructure. *South Asia: Journal of South Asian Studies*, 42(3), 572–587.
9. Citron, D. K. (2008). Technological due process. *Washington University Law Review*, 85(6), 1249–1313.
10. Corbridge, S., Williams, G., Srivastava, M., & Véron, R. (2005). Seeing the state: Governance and governmentality in India. Cambridge University Press.
11. Dalberg. (2019). State of Aadhaar: A people's perspective. Dalberg.
12. Drèze, J., Khalid, N., Khera, R., & Somanchi, A. (2017). Aadhaar and food security in Jharkhand: Pain without gain? *Economic and Political Weekly*, 52(50).
13. Drèze, J., & Khera, R. (2018, February 8). Aadhaar's \$11-bn question: The numbers being touted by government have no solid basis. *The Economic Times*.
14. Drèze, J., Khera, R., & Somanchi, A. (2020). Balancing corruption and exclusion: A rejoinder. *Ideas for India*.
15. Dunleavy, P., Margetts, H., Bastow, S., & Tinkler, J. (2006). New public management is dead—Long live digital-era governance. *Journal of Public Administration Research and Theory*, 16(3), 467–494.
16. Eubanks, V. (2018). Automating inequality: How high-tech tools profile, police, and punish the poor. St. Martin's Press.
17. Fox, J. (2007). The uncertain relationship between transparency and accountability. *Development in Practice*, 17(4–5), 663–671.
18. Government of India. (2025). A quantitative assessment of India's Direct Benefit Transfer system (BlueKraft Digital Foundation, cited by the Ministry of Finance). Government of India.
19. Gupta, A. (2012). Red tape: Bureaucracy, structural violence, and poverty in India. Duke University Press.
20. Herd, P., & Moynihan, D. P. (2018). Administrative burden: Policymaking by other means. Russell Sage Foundation.
21. International Monetary Fund. (2023). Stacking up the benefits: Lessons from India's digital journey (IMF Working Paper No. 2023/078). International Monetary Fund.
22. Katzenbach, C., & Ulbricht, L. (2019). Algorithmic governance. *Internet Policy Review*, 8(4).
23. LibTech India. (2020). Length of the last mile: Delays and hurdles in NREGA wage payments. Azim Premji University.
24. LibTech India. (2024). MGNREGA implementation in India: Insights and trends, April–September 2024. LibTech India.
25. Lipsky, M. (1980). Street-level bureaucracy: Dilemmas of the individual in public services. Russell Sage Foundation.
26. Mahatma Gandhi National Rural Employment Guarantee Act, No. 42 of 2005 (India).
27. Masiero, S., & Das, S. (2019). Datafying anti-poverty programmes: Implications for data justice. *Information, Communication & Society*, 22(7), 916–933.
28. Maynard-Moody, S., & Musheno, M. (2003). Cops, teachers, counselors: Stories from the front lines of public service. University of Michigan Press.
29. Ministry of Finance, Government of India. (2013). Direct Benefit Transfer: Operational guidelines. Department of Economic Affairs.
30. Muralidharan, K., Niehaus, P., & Sukhtankar, S. (2016). Building state capacity: Evidence from biometric smartcards in India. *American Economic Review*, 106(10), 2895–2929.
31. Muralidharan, K., Niehaus, P., & Sukhtankar, S. (2025). Identity verification standards in welfare programs: Experimental evidence from India. *The Review of Economics and Statistics*, 107(2), 372–392.

32. Narayanan, R., Dhorajiwala, S., & Golani, R. (2019). Analysis of payment delays and delay compensation in MGNREGA: Findings across ten states for financial year 2016–2017. *Indian Journal of Labour Economics*, 62(1), 113–133.
33. Peeters, R., & Widlak, A. (2018). The digital cage: Administrative exclusion through information architecture — The case of the Dutch civil registry's master data management system. *Government Information Quarterly*, 35(2), 175–183.
34. Scott, J. C. (1998). *Seeing like a state: How certain schemes to improve the human condition have failed*. Yale University Press.
35. Somanchi, A., Bej, S., & Pandey, M. (2017). Well done ABBA? Aadhaar and the public distribution system in Hyderabad. *Economic and Political Weekly*, 52(7).
36. Yeung, K. (2018). Algorithmic regulation: A critical interrogation. *Regulation & Governance*, 12(4), 505–523.