



Understanding

Exclusion due to use of Digital Technology

in Welfare Programmes

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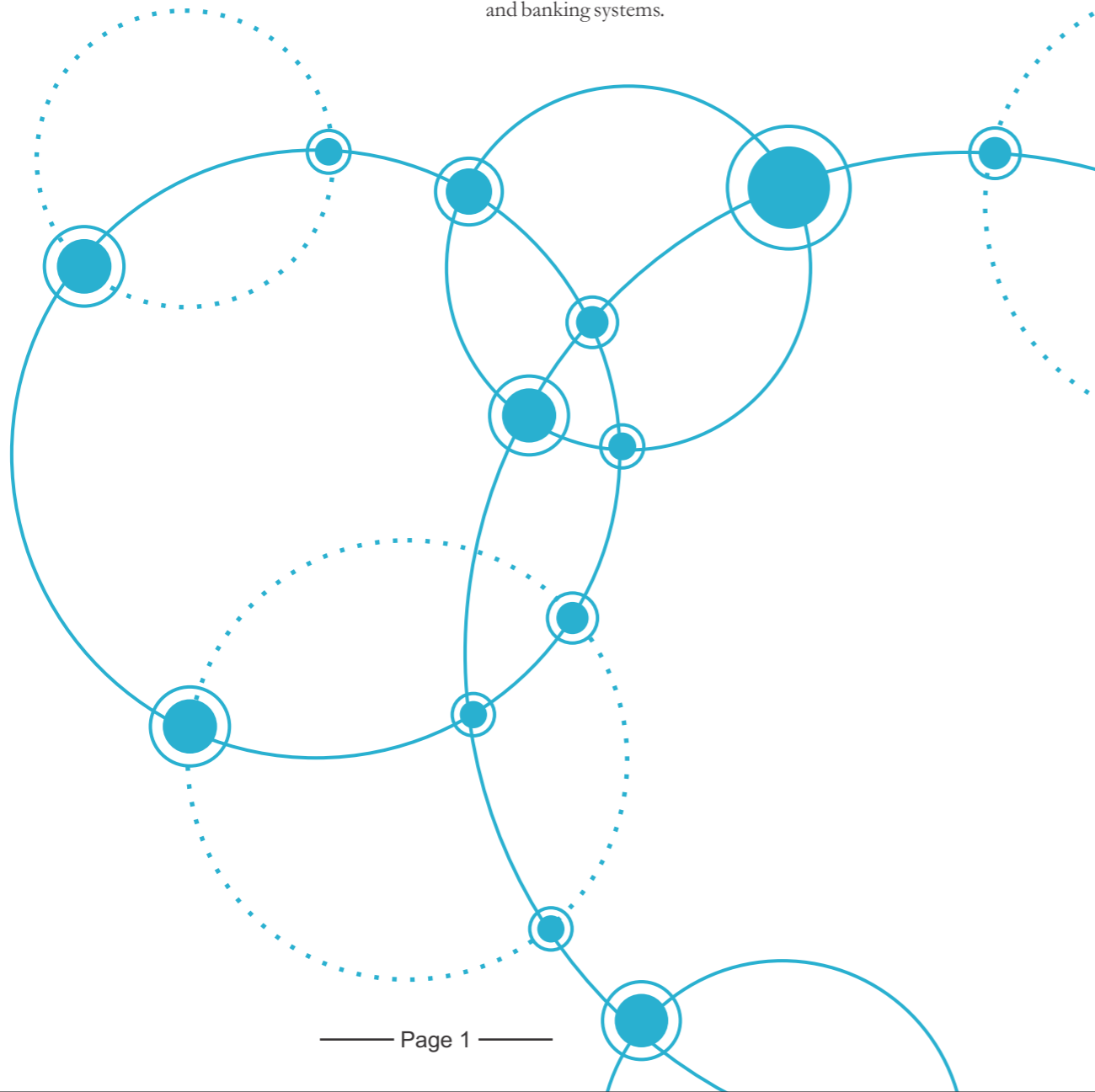
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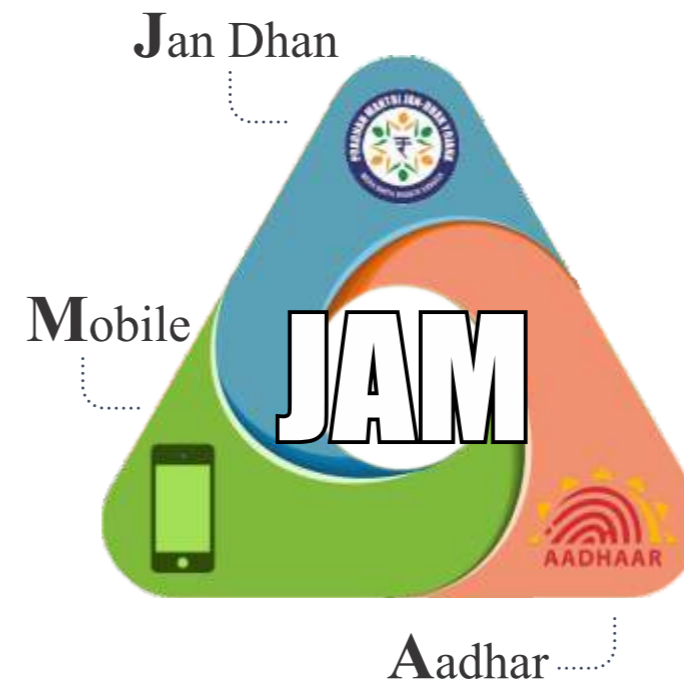
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India is rapidly transforming delivery of its social welfare programmes using innovative technology solutions and frameworks. JAM (JanDhan-Aadhaar-Mobile) trinity, in particular, has emerged as the preferred framework for delivery of both "in-cash" and "in-kind" benefits. "Aadhaar" in the JAM framework enables identification and authentication of the beneficiaries; "JanDhan" account in the framework enables rolling out the scheme / programme in Direct Benefit Transfer (DBT) mode; "Mobile" number in the framework provides a factor of authentication (OTP based) and helps increase transparency and accountability in the delivery of benefits. Owing to the success of this framework, cash benefits in around 500 central schemes across Ministries / Departments are targeted to be delivered through the DBT mode in FY 17 -18. While JAM appears to be a robust framework for targeted delivery of benefits and reduce exclusion; exclusion, albeit of a different nature, is still present caused by

- Beneficiary not having an Aadhaar number - Particularly, those below 18 and those who have not received their Aadhaar number
- Beneficiary not having a Bank Account - Particularly, where the beneficiary of a scheme (e.g. women) is different from the account holder in the household
- Aadhaar not seeded / incorrectly seeded - In schemes / programmes and bank accounts
- Biometric mismatch - Due to various reasons such as age of the beneficiary, technology, process, age of the biometrics in the system etc.
- Unavailability of power and connectivity - And inability to pay for the power and connectivity resulting in digital divide
- Payment credit failures - Due to non-seeding and incorrect seeding of Aadhaar numbers and name mismatch in Aadhaar and banking systems.



- Limited cash out infrastructure and alternative payments options - Imposing a "rent" on the beneficiaries for availing the benefits
- Lack of transparency and accountability - Due to incomplete feedback loop with regard to effectiveness of benefit transfer programmes.



Policy makers, while designing or implementing schemes on JAM framework or DBT, still need to assess the extent of exclusion that can result from usage of digital technology. Therefore, this document explores "beneficiary exclusion" in the context of adoption and usage of "digital technology" for delivery of social welfare benefits. This document also gives an overview of possible interactions between the "factors" and "influencers" that can potentially cause "exclusion".

Still, in absence of quality data and extensive research, it is difficult to quantify the extent of exclusion on account of digital technology. Therefore, targeted research is specifically required

- On identified factors and influencers of exclusion
- On digital divide amongst various socio-economic and regional groups
- To Rank regions by availability of various infrastructure at the last mile that facilitate digital transactions.

Additionally, there is a need to innovate beyond JAM specifically, in using technology in the design stage, developing analytics solutions and closer engagement with beneficiaries as part of their empowerment.

02 BACKGROUND

The service delivery of social welfare programmes is undergoing rapid change due to adoption and infusion of technology enabled applications at various levels. The most prominent changes have been in beneficiary identification during enrolment, beneficiary authentication at the time of service delivery and in disbursement of cash benefits. A key force driving this change is the emergence of the JAM (Jan Dhan-Aadhaar-Mobile) framework for service delivery. Increasingly Aadhaar is being used for identification of the beneficiary during enrolment and for authentication of the beneficiary at the time of service delivery. Cash benefits are now being directly

credited into the bank accounts of the beneficiaries. For many schemes, Aadhaar and Direct Benefit Transfer (DBT) are mandatory.

As on 15th May, 2017 based on projected population as on 2015 (estimated to be about 128 Cr.), about 90% of the population (about 115 Cr.) has been issued an Aadhaar number. At the end of November, 2016 the mobile subscriber base in India stood at 110 Cr. As on 14th June, 2017 under the Pradhan Mantri Jan-

Dhan Yojana (PMJDY), bank accounts have been opened for 28.9 Cr. beneficiaries. Therefore, JAM framework appears to be a robust framework for targeted delivery of benefits directly to the beneficiary and reduce leakages and ghost beneficiaries. But there is also a need to look deeper, beyond these numbers - whether this digital technology can create beneficiary exclusion, albeit of a different nature, and what needs to be done to address this new type of exclusion.



03

HOUSE OF EXCLUSION

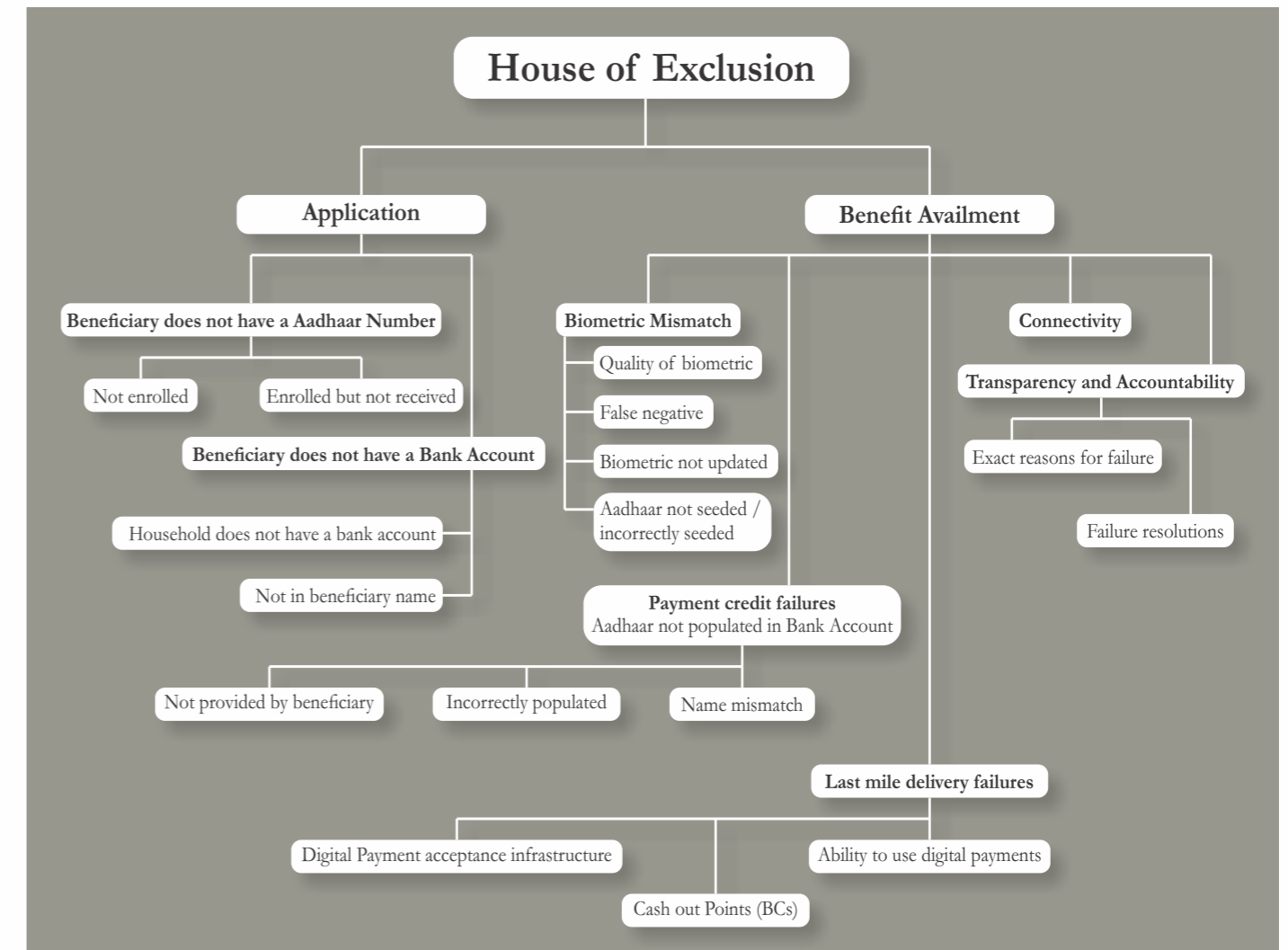
In a very simplistic model of social welfare delivery, beneficiaries apply for social security benefits that they are eligible for (based on their socio-economic condition) and upon their inclusion in the programme/scheme they receive the benefits they are entitled to in cash or in kind. Typically, those excluded are

- a. Beneficiaries whose socio-economic conditions are different from the programme / scheme conditions i.e. exclusion due to "non-universal" nature of a scheme / programme
- b. Beneficiaries who are unable to prove their identity
- c. Beneficiaries who are unable to prove their socio-economic conditions
- d. Beneficiaries whose benefits get pilfered due to various factors such as presence of intermediaries, lack of awareness, empowerment etc.

While (a) is a policy decision, the JAM framework and DBT are specifically intended to reduce exclusion arising out of (b) and (d). Exclusion arising out of (c) are being addressed through various digitization initiatives outside of the JAM framework and DBT. Under the JAM framework and DBT

- a. Beneficiaries give Aadhaar Number during the application process. This helps to establish their identity
- b. Cash Benefits are directly credited to the bank account of the beneficiaries. "Cash" can be withdrawn or consumed after due authentication
- c. In-Kind benefits can be availed by the beneficiaries after authenticating themselves.

This process from application to availing of actual benefits leverages technology. Below is the house of exclusion that can potentially get created out of the technology usage.



The above exclusion occur due to various reasons.

04 APPLICATION STAGE

Exclusion at the application stage can result from

I. Applicant does not have an Aadhaar Number – An applicant may not have an Aadhaar number either (a) due to non-enrolment in Aadhaar or (b) due to non-receipt of the Aadhaar number.

a. *Non-enrolment in Aadhaar* – Non-enrolment in Aadhaar could be due to age (particularly below 5), disinclination, inaccessible and difficult areas, inadequate enrolment centres nearby, amongst other reasons. As on 15th May, 2017 based on projected population of children below 5 years of age as on 2015 (estimated to be about 12 Cr.), only about 35% of them (about 4 Cr.) have been issued an Aadhaar number. Only about 75% of the children between 5 and 18 years of age have been issued an Aadhaar number on the projected population.

b. *Non-receipt of the Aadhaar Number* – There are also instances of residents who have enrolled for Aadhaar have not received the Aadhaar number. Since Aadhaar does not have an activation process, the best possible estimate of residents being aware of their Aadhaar number can only be made from the unique Aadhaar numbers populated across services. But, collation of this data in itself is a huge activity. To reduce exclusion due to non-receipt of Aadhaar card, alternative options such as downloading the Aadhaar card online (by providing the enrolment id, name, pin-code and mobile number as in the enrolment slip) and e-KYC have been provided. In cases where the Aadhaar number has not been generated, applicant can apply for a scheme with the Aadhaar enrolment id. However, as most applicants are rural-based and socio-economically weak, they have limited digital literacy or avenues to access information electronically.

A lot depends upon the availability of assisted infrastructure for such purposes. For e-KYC, e-KYC infrastructure has to be ubiquitously available. Although beneficiaries can apply for a scheme with the Aadhaar enrolment id, it is not a substitute for Aadhaar. The onus of getting the Aadhaar number and updating it in relevant places is still on the beneficiary. Besides, while usage of Aadhaar enrolment id can partially address application stage exclusion, it cannot facilitate DBT credits nor can it enable withdrawal of benefits through AePS.

ii. **Applicant does not have a Bank Account** – Under PMJDY, although almost every household has been provided with a bank account, many of these accounts are inactive. Further, for the purpose of DBT, it may just not be sufficient to have one account per household, since it is quite possible that the actual beneficiary / applicant in the household does not have the account in his name. Such situations are most likely to exclude women, and this makes it difficult to implement programs which target women and seek to directly credit the accounts of female beneficiaries.



05 BENEFIT AVAILMENT STAGE

BENEFIT



Entitlements are in cash or in kind. Availing either of the benefit may require an Aadhaar biometric / OTP authentication. Exclusion at the benefit availment stage could result from:

I. Aadhaar not seeded / incorrectly seeded – Seeding of Aadhaar number across schemes continues to be low. As of March, 2017, the number of schemes monitored under DBT has increased to 140. Out of these schemes, except for MNREGS and PAHAL which have each achieved about 82% seeding of Aadhaar number, seeding of Aadhaar number in other schemes is about 50%.

Incorrect seeding in the scheme / programme databases leads to immediate exclusion in "in kind" benefit schemes / programmes due to non-identification of the beneficiary, whereas in "cash transfer" schemes / programmes, the benefit could be wrongly transferred to another person leading to the exclusion of the actual beneficiary. The Aadhaar linked PDS pilot in "Nuh" District of Haryana during November and December, 2016 had to be called off due to such exclusion.

ii. **Biometric Mismatch** – Reliable data on success rate of Aadhaar authentication is not available. In certain States, Aadhaar biometric authentication failure rate is as high as 36% which many fear could be reflective of a nationwide trend. Biometric mismatch leads to immediate exclusion with respect to "in kind" benefit schemes / programmes due to non-identification of the beneficiary, whereas in "cash transfer" schemes / programmes, the benefit may get transferred to the beneficiary bank account but cannot be availed through AePS

(Aadhaar enabled payment system) as AePS supports only biometric (fingerprint) based authentication. There can be several reasons for biometric mismatch some of which are listed below

- **Quality of Biometrics** – Fingerprint matching is currently the widely used form of matching. Quality of this biometric depends upon (a) actual quality of the beneficiaries' fingerprints (b) process of capturing the fingerprints and (c) fingerprint capture infrastructure quality and maintenance. Actual quality of fingerprint is dependent on factors such as age, livelihood activities and an individual's biometric aging from the time since it was collected and stored in the Aadhaar database (some of the biometrics have been collected more than 6 years earlier and the individual's biometric may have aged). While alternate options in the form of OTP based validation and IRIS scan are available, non-registration of the mobile number with Aadhaar eliminates the OTP option. IRIS infrastructure for authentication is largely unavailable.
- Although biometric scanning devices which can be used for authentication are certified by UIDAI, the upkeep and maintenance is completely in the hands of the service providers.
- **Biometrics not updated** – In some cases, as highlighted above, biometrics have to be recaptured. Also for children (below 5) biometrics are not collected at the time of

1 Source - <https://scroll.in/newsrepublic/831474?s=cm>

2 Source - <http://www.livemint.com/Politics/Uf5B33ZB2sYKpmLqwMke8O/Aadhaar-fails-MGNREGS-test-in-Telangana.html>

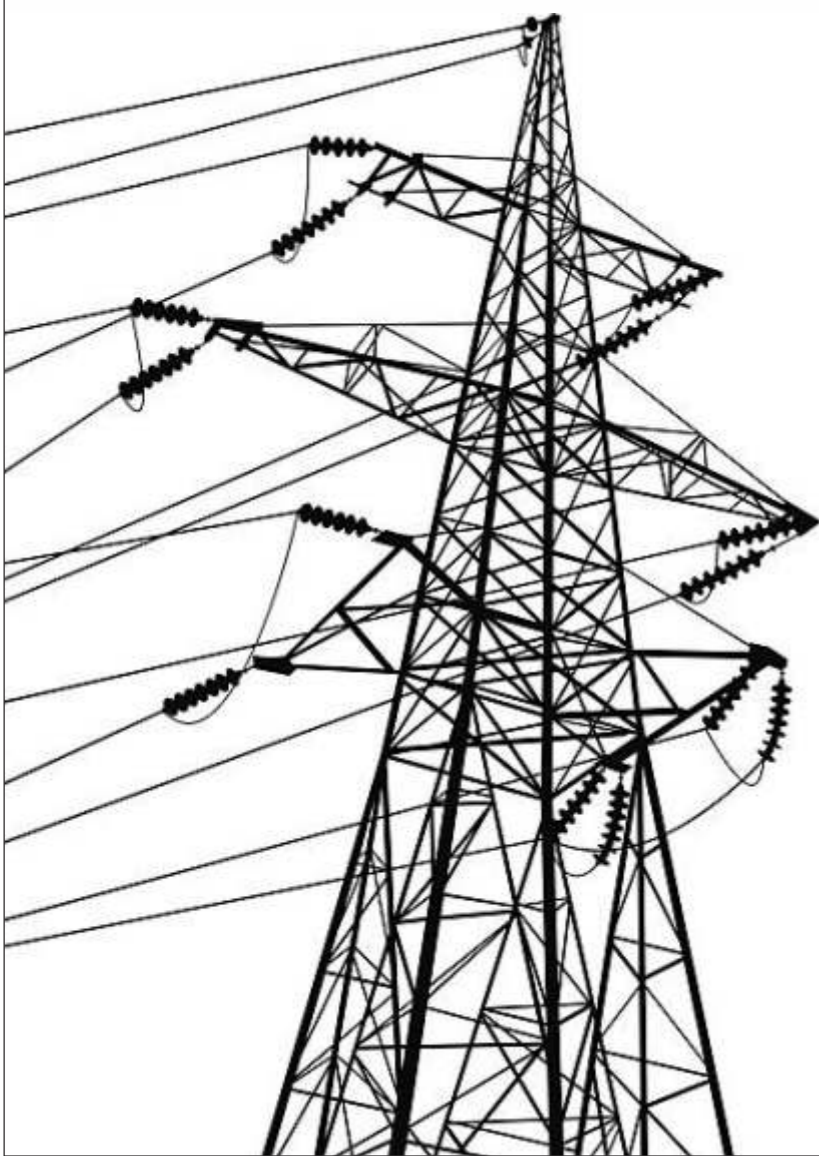
3 A village would be declared as electrified if: 1) Basic infrastructure such as Distribution Transformer and Distribution lines are provided in the inhabited locality as well as the Dalit Basti/ hamlet where it exists. (For electrification through Non-Conventional Energy Sources a Distribution transformer may not be necessary). 2) Electricity is provided to public places like Schools, Panchayat Office, Health Centres, Dispensaries, Community centers etc. and 3) the number of households electrified should be at least 10% of the total number of households in the village [Source - <https://data.gov.in/catalog/progress-report-village-electrification>].

enrolment. The biometrics need to be updated upon the child reaching 5 years of age and subsequently needs to be updated again upon reaching 15 years of age.

- False negative - Biometric matching is not completely free of errors. Even in case of certified devices, there is a false reject rate of upto 2% that is permissible. Therefore, exclusion can result from false negative matching.

iii. **Unavailability of Power and Connectivity** – Power and Connectivity are important for availing benefits of digital technology. While stress is on village level electrification, to make a significant impact on digital divide at the level of an individual, it is necessary to focus on household level electrification. 25% of rural households across the country still have no electricity. In Uttar Pradesh, Nagaland, Jharkhand and Bihar, fewer than 50% of rural households have electricity. Mobile blind-spots remain. About 55,000 villages in India do not have mobile coverage. Connectivity remains unreliable and inconsistent in many places where it is available.

Besides, the ability of the people to pay for the electricity and



connectivity is an important factor towards digital inclusion. While there are subsidies to address other kinds of deprivation, exclusion with respect to connectivity at the individual/household level is yet to be addressed effectively.

iv. **Payment Credit failures** - The Committee on digital payments, headed by Ratan P Watal, which published its report in December, 2016 has mentioned that "it has been brought in the Committee's notice that till recently, more than 60% of OFF-US AEPS (Aadhaar enabled payment system) transactions were failing".

Payment credit failures to actual beneficiaries could be on account of (a) Aadhaar not populated in the bank account of the beneficiary (b) Aadhaar incorrectly seeded in the bank account and (c) Name mismatch between the Aadhaar and Banking systems. As on March, 2017, Aadhaar seeding of PMJDY accounts was 63.61%. The South zone workshop on 'Aadhaar Enabled Applications', organised by the Unique Identification Authority of India (UIDAI) in April 2017, has shed light into the issue of wrong mapping and seeding of Aadhaar data in bank accounts. In the case of Parihara- a scheme that provides input subsidy to drought affected farmers through DBT/AEPS, subsidies were not transferred to about three per cent of the beneficiaries, which actually translated to a total of 40,000 beneficiaries. Incorrect seeding of Aadhaar and name mismatches in Aadhaar and bank account were the main reasons. Seeding is more prone to errors in remote areas.

v. **Limited cash out infrastructure and alternative payment options** - While crediting "cash" directly into the bank account of beneficiaries is intended to cut "rent seeking" by intermediaries and thereby reduce exclusion of intended beneficiaries, this inclusion mechanism is in itself is not devoid of "rent seeking" behaviour. (a) Limited cash out infrastructure (b) inadequate alternative digital payments options and (c) digital divide in using digital payments are important constraints that provide a fertile ground for rent-seeking. As per a study done by us amongst consumers and retailers in low, medium and high MPCE locations,

- a) Only about 36% of the consumers have a Smartphone. Smartphone ownership amongst females is still lower at about 30%
- b) Only about 29% of consumers who have a mobile phone use internet on their mobiles.



- c) Only about 35% of consumers have a debit card. Fewer females have debit cards compared to males. Access to credit cards and other digital payments mode is such as mobile wallets, UPI etc. is very low.
- d) Only about 11% of the retailers accepted cashless payments. Only about 5% have a POS device.

Because of the gap in digital payments infrastructure, beneficiaries incur a "cost" on benefit availment during cash withdrawal and other transactions.

vi. **Transparency and accountability** - Today, despite technology inclusion, a large cause of exclusion is the incomplete feedback loop for the beneficiary. In many cases, beneficiaries are not aware of the exact reasons for exclusion (even though they are eligible for the scheme) and what has to be done to fix it. Digital divide, non-empowerment and non-communication of the reason and remedy leave them with little choice other than accepting exclusion. Also, exact reasons of exclusion at various stages are not immediately traceable due to the existence of multiple systems and stakeholders, and the complex interfaces that they have with each other. Inadequate processes and lack of clarity with regard to issue resolution, often results in poor accountability.



vii. **Conditionality** - Many of the benefits are conditional in nature i.e. the beneficiary is given the benefit only when certain conditions are fulfilled. For instance the erstwhile, Indira Gandhi Matritva Sahyog Yojana (IGMSY) in which INR 6000 was being given to pregnant women of age 19 years and above in two instalments as under

- The 1st transfer of INR 3000 required the mother to
 - i. Register pregnancy at the Anganwadi centre (AWC) within four months of conception
 - ii. Attend at least one prenatal care session and taking Iron-folic acid tablets and TT (tetanus toxoid injection), and
 - iii. Attend at least one counselling session at the AWC or healthcare centre.
- The 2nd transfer of ₹3,000 required the mother to:
 - i. Register the birth
 - ii. Immunize the child with OPV and BCG at birth, at six weeks and at 10 weeks
 - iii. Attend at least two growth monitoring sessions within three months of delivery

Such information may be maintained in different systems not linked by a common identifier. Although Aadhaar is to act as a common identifier for beneficiaries across schemes, it is not yet seeded in all the databases.

4 Source - <http://www.hindustantimes.com/india-news/in-2-years-bjp-govt-electrified-13523-villages-only-8-were-completely-electrified/story-FWzAtRcHnCbEwF1DeV3pmM.html>

5 Source - <http://indianexpress.com/article/technology/tech-news-technology/55669-villages-in-india-do-not-have-mobile-coverage/>

6 Source - <http://www.thehindubusinessline.com/money-and-banking/ap-tops-in-aadhaar-seeding-of-jan-dhan-acs/article9598511.ece>

7 Source - <http://www.newindianexpress.com/cities/bengaluru/2017/apr/29/bankers-errors-in-aadhaar-seeding-hurting-beneficiaries-officials-1599033.html>

8 MPCE - Monthly per capita expenditure. For a household, MPCE is the total consumer expenditure over all items divided by its size and expressed on a per month (30 days) basis.

The exclusion can be categorized to be arising out of the following

- a. Core Technology
- b. Process
- c. Infrastructure Divide (Power, Connectivity, Aadhaar Permanent Centres (APC), Cash Out Points (COP) / BCs, Alternate digital payments infrastructure (ADPI))



d. Digital Divide (Ability to use digital payments, Ability to seed Aadhaar digitally, Ability to check and verify information digitally, Ability to digitally trace and understand exclusion reasons, Individual's access to instruments that enable them to consume digital technology e.g. Smartphones, payments instruments, connectivity etc.)

e. Demography (Gender, Age)

Co-relation amongst the factors and amongst the influencers could also be present. For instance, infrastructure divide could be correlated to digital divide. Similarly, digital divide may be affected by demography as also socio-economic factors.



EXCLUSION	INFLUENCERS									
	Technology	Process	Infrastructure Divide					Demography		Digital Divide
			Power	Connectivity	APC	COP / BCs	ADPI	Age	Gender	
Aadhaar enrolment					✓			✓		
Aadhaar number not available		✓			✓					✓
Household does not have a bank account						✓				
Account not in beneficiary name								✓	✓	
Aadhaar Seeding										✓
Authentication failures	✓	✓		✓	✓			✓		✓
Payment credit failures		✓								✓
Last mile delivery failures			✓	✓		✓	✓			✓
Transparency and accountability	✓	✓								✓



Policy makers, while designing or implementing schemes on JAM framework and DBT need to assess the exclusion that will result from digital technology by evaluating the scheme enrolment and delivery framework against the above matrix. Besides, reducing exclusion requires extensive research, creating infrastructure and designing simple and innovative solutions to reduce the digital divide.

a. **Research** – The extent of exclusion on account of digital technology is difficult to quantify in the absence of quality data. Research is specifically desired on

- *Biometric technology* – There has to be a continuous research on biometric technology. Research has to be undertaken on (a) Improving the technology and (b) Understanding technology failures and thereafter defining appropriate policies and processes for reducing exclusion. Today, a lot of data is already available in digital form which can be used to understand biometric technology failures.
- *Factors and influencers of exclusion* – Primary research should be undertaken on each of the factors and the influencers to assess the extent of exclusion created by them. Multiplier effect also needs to be studied. For instance, the extent of exclusion could be extremely high in a scheme for women where the benefit is being directly credited into bank account of women in low connectivity areas. Models for estimating multiplier effects when multiple factors are present at the same time have to be devised to understand and reduce exclusion.
- *Digital Divide* – Digital divide can undermine efforts to infuse digital technology. Therefore, digital divide has to be continuously assessed and a digital divide index should be created in terms of
 - I. Demography
 - ii. Socio-economic groups
- *Last mile digital infrastructure to consume digital technology* – A last mile digital infrastructure index needs to be created and different locations and regions need to be mapped on this index. Research also needs to be initiated to assess whether the criteria being currently used to measure the achievement of these targets (for instance the criteria used to declare a

village as electrified) need to be redefined to reduce exclusion arising out of infusion of digital technology. Also, research has to be initiated to create viable last mile business models for such infrastructure providers.

b. **Infrastructure** – The digital technology infrastructure strategy has to be clearly articulated. While there are specific targets on electrification and connectivity, similar targets need to be set and tracked for other last mile digital infrastructure elements (such as those defined above) to reduce the infrastructure divide. Also, the last mile digital infrastructure has to be consolidated to create viable business proposition for the providers. Appropriate policies have to be devised to plough back the savings on account of DBT for creating and sustaining this digital payment infrastructure.

c. **Creating a single unified database** – Some of the common data such as Aadhaar and bank account seeding etc. are required to be provided by the beneficiary separately for each and every scheme / programme being delivered in DBT mode. As a result, correct seeding of the data in one scheme does not guarantee a correct seeding in another. Therefore, there is a need to create a common household database where beneficiary could update the common data once which could thereafter be used by multiple schemes / programmes. This would reduce errors in seeding.

d. **Innovative solutions** – Innovations in digital technology have to go beyond JAM.

- *Use technology right from the design stage* – To reduce exclusion, technology has to be used right from the design stage. Scheme and programme level information has to be consolidated to reduce exclusion errors during design. Existing databases such as SECC etc. should be used to understand the coverage of a scheme (by State, district, socio-economic group, gender, age etc.) based on the eligibility conditions.
- *Develop predictive analytics* – Predictive analytics can be used to estimate the extent of exclusion. A platform where different databases on last mile digital infrastructure, scheme, and individuals/households etc. can be plugged and used for such purposes can be created.
- *Empower beneficiaries* – If digital technology has to reduce exclusion, the beneficiaries need to be empowered digitally. More and more detailed information has to be made available to the beneficiaries. Also, beneficiaries have to be educated on ways to access and use this information for their benefit. Innovate ways to disseminate and educate beneficiaries on various aspects needs to be devised by leveraging the high penetration of mobile phones.



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