HELLO

DATA PEOPLE
INDIA’S DATA DILEMMA WITH INDIA STACK

SUNDEEP REDDY MALLU

STRATA DATA CONFERENCE. 1ST MAY 2019

TWITTER - @SUNDEEPRM
AARUSH – THE COBBLER

Services footwear, zips and belts
Kunal Icon Road, Pimple Saudagar, Pune
Works 7 to 9 hour days
On average earns INR 750 to 850 per day
Gets 80% of his revenue via Payment Apps #PayTM #PhonePe #UPI
Uses a mid-range mobile phone
Has a no balance bank account
Has done e-KYC to set up digital payments
Take any amount from Rs. 5000-Rs. 20,000 instantly with Debit Card EMI on FreeCharge App & spend on more than 1 lac merchants; Payback in EMIshttps://frch.in/e1
### Average Price of Per GB of Data

<table>
<thead>
<tr>
<th>Country</th>
<th>USD</th>
</tr>
</thead>
<tbody>
<tr>
<td>United Kingdom</td>
<td>$6.66</td>
</tr>
<tr>
<td>USA</td>
<td>$12.37</td>
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<tr>
<td>China</td>
<td>$9.89</td>
</tr>
<tr>
<td>India</td>
<td>$0.26</td>
</tr>
</tbody>
</table>

Source: cable.co.uk - World wide mobile data pricing report. November 2018
By 2018, due to JAM, India embraced digital

1.21 Bn Mobile Connections
1.22 Bn Aadhaar Enrolments
462M Internet Users
$8B Digital payment transactions monthly
582M Unique Bank Accounts
10M Registered Businesses
Disruption – How does it happen

Disruptive solutions ride on shared infrastructure

- Maps
- Payment
- OS
- Smartphone
- Cloud Infrastructure
- Internet
- GPS
India Stack is an open infrastructure built by Indian Government which unbundled identity, signature, money exchange, document & data exchange allowing apps and solutions to be built easily.
There are now 1200+ Mn mobile connections, connecting over 700+ Mn Unique Subscribers

Many of them are accessing 4G internet speeds with quotas of 1 GB/day, at a ARPU of less than 90 Rupees.

Source: COAI, TRAI
Aadhaar has enrolled **99%** of the adult population across India - enrolling 2M/day at its peak

**AADHAAR IS THE WORLD’S LARGEST BIOMETRIC IDENTIFICATION SYSTEM**

Source: UIDAI website
10X number of Jandhan Bank Accounts in 3 years

Starting with 30 Mn accounts in Sep-2014, India crossed 300 Mn Jandhan accounts in Sep-2017

850 Mn
Aadhaar-Seeded Bank Accounts

582 Mn
Unique Bank Account Holders

Source: UIDAI website, PMJDY Website, as of Feb-2018
India achieved this by building Foundational Digital platforms.

*Paperless, cashless, presenceless, and with electronic consent*
India’s Digital DNA

Powered at scale by India Stack

**IDENTITY LAYER**
A unique digital biometric identity with open access of nearly a Billion users

**PAPERLESS LAYER**
Rapidly growing base of paperless systems with billions of artifacts

**PAYMENTS LAYER**
Game changing electronic payment systems and transition to cashless

**TAX LAYER**
All B2B business of India entities to flow through this fabric every month

**CONSENT LAYER**
Provides a modern privacy data sharing framework
India’s Digital DNA

Powered at scale by India Stack

IDENTITY LAYER
A unique digital biometric identity with open access of nearly a Billion users
**AADHAAR - THE COUNTRY’S FIRST DIGITAL IDENTITY PLATFORM**

- Name
- DoB/Age
- Gender
- Address
- Mobile/Email

1234 5678 9012

**Foundational**
**Minimal**
**Unique**
**Lifetime**

Source: http://uidai.gov.in
AADHAAR ENROLMENT PROCESS
IT IS ONE OF ONLY 7 GLOBAL PLATFORMS TO REACH A BILLION USERS!

Source: http://www.cbinsights.com, portal.uidai.gov.in, wikipedia
India’s Digital DNA

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IDENTITY LAYER
A unique digital biometric identity with open access of nearly a Billion users

AUTH LAYER
Rapidly growing base of paperless systems with billions of artifacts
AADHAAR - IDENTITY APIs enable presence-less and paperless verification

Authentication
ELIMINATES PHYSICAL PRESENCE
Are you who you claim to be?
ONLY a yes/no answer
Anytime anywhere

Electronic KYC
ELIMINATES PAPER BASED KNOW YOUR CUSTOMER
ONLY done with authentication
No more fake documents
Anytime anywhere

Source: http://uidai.gov.in
Aadhaar Authentication is being used to:

- Open bank accounts,
- Get SIM cards,
- Mark attendance of public sector employees,
- ...And many more uses

10 Bn Aadhaar Authentications in 2017 - 8 Bn till Aug 2018!

Source: UIDAI website
AUTHENTICATION VIA BIOMETRIC OR MOBILE BASED OTP
India’s Digital DNA

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PAYMENTS LAYER
Game changing electronic payment systems and transition to cashless
Pre-2016, most Indians still transacted in cash because of:

➔ Fragmented digital payment modes
➔ Complexity
➔ High cost of transactions

<15% Transactions are Digital Payments

<10% Bills are paid online

<2 POS /1000 Debit Cards

Source: Google-BCG report
Unified Payments Interface Standardized Language of Money Transfer

We created a foundational, Interoperable, multi-provider instant money exchange framework.

Universally interoperable
Anyone with a bank or mobile money account can send money to any other account in India!

Single Payment Address
No need to disclose account information. Allows account portability, enhances privacy.

Mobile First Payments
To leverage the increasing proliferation of mobile phones.

Minimal Issuer/Acquirer Cost
Smartphone replaces card and Payment Address replaces PoS machine!

Source: http://npci.org.in
UPI is the fastest growing digital payments platform globally

More transactions per month on UPI in 18 months than on Credit and Debit Cards after nearly 40 years!

Source: RBI website

512 Mn Txns &
12B $ in Nov 2018
More transactions per month on UPI in 18 months than on Credit and Debit Cards after nearly 40 years!
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**PAPERLESS LAYER**
Online electronic signature service & a digital locker for documents

**PAYMENTS LAYER**
Game changing electronic payment systems and transition to cashless
Digital Locker - eliminating paper!

Machine-readable documents
Digitally protected
2.3 Bn documents issued

Source: https://digilocker.gov.in
Digital Locker - eliminating paper!

Now, DigiLocker will help you to consolidate Driving License & Vehicle RC in Your Mobile Phone

Source: https://digilocker.gov.in
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CONSENT LAYER
Provides a modern privacy-enhancing data sharing framework based on electronic consent

India’s Digital DNA

Powered at scale by India Stack
A new consent based Data Empowerment approach!

Data Providers

- DP #1
- DP #2
- DP #3
- DP #N

Data Consumers

- DC #1
- DC #2
- DC #3
- DC #N

Consent Collector

- Consent to share data
- Electronic Consent Artefact Authorization via 2-fa

Data Access Notifications

Request for Data

E2E Encrypted Data Flow based on User Consent

Registry
The Account Aggregator will facilitate consented sharing of financial information in real-time.
This is not a pipe dream!

India has enabled very high volume, high trust, low cost, bit-sized, real-time digital transactions, anytime, anywhere on any device for 1.3 Billion Indians

IDENTITY LAYER
A unique digital biometric identity with open access of nearly a Billion users

PAYMENTS LAYER
Game changing electronic payment systems and transition to cashless

SIGNATURE LAYER
Online electronic signature service available in the hands of every Indian

CONSENT LAYER
Provides a modern privacy-enhancing data sharing framework based on electronic consent

- 3.5 Bn Digital Docs
- 33 Mn e-Signatures
- 674 Mn (monthly) 500 Mn (unique users)
- 1.23 Bn Digital Identity Holders
Realized / Stated Benefits of India Stack

1. Linking of Direct Benefit Transfer (DBT) to Aadhaar – plugs leakage
   1. NREGA in AP leakage reduced by 10%
   2. LPG subsidy transferred via DBT reduced purchase by 11%
2. Access to micro-credit
   1. Small time vendors opting for Digital transaction being offered credit without submitting applications
3. Lower transaction cost
   1. Manual KYC to e-KYC – 1 day to 4 minutes
   2. Bank Customer onboarding 6 days to 1 hour
India is a true Data Democracy today
THE DO NO HARM TEST

People shouldn’t be afraid of their government. Governments should be afraid of their people – Alan Moore, V for Vendetta
IDENTITY LAYER - Aadhaar

1. Denial of Civil Rights
2. Citizens cannot access pension, ration, wages and Vote
3. The de-duplication algorithm does not work as expected
4. No synchronization of government databases.
5. Folks being registered without IRIS and finger prints
6. No clarity between Central or state government, Supreme Court, RBI
**Auth Layer**

1. High failure rate in authentication
2. No information of why an authentication failed
3. Key government services were being denied due to auth failure. In some cases more than months.
4. Lack of transparency in approach being used for authentication and information storage
5. Need or capture of finger prints at periodic intervals
6. Falsification of fingerprint for Attendance Verification System. Dummy finger prints available for as low as INR 15 / finger
PROJECT SAVINGS – NO SUBSTANTIATION

1. World Bank figure of $11 billion per year, no substantiation. An extrapolation based on two small studies
2. No government audit report confirming savings attributed to Aadhaar alone
Consent Layer

1. Companies taking consent for one function but using the information for other purposes
2. No option for citizens to opt out of given consent easily
3. Companies know MORE about citizens that citizens themselves. This creates incentive for companies to take decisions that are not transparent
4. Aadhaar-based identity fraud instances are being reported. There is no Data Protection Framework/law. A draft was published in 2018. If your digital identity is compromised there is not legal safeguards.
I’ll be more than happy to hear your thoughts.

THAT IS ALL FOR TODAY – THE DILEMMA CONTINUES
Cyberconflict: A new era of war, sabotage, and fear

Saturday, 10:10 AM Wednesday, March 27, 2019
Location: Ballroom
Category: Security & Privacy

Rate This Session

We’re living in a new era of constant sabotage, misinformation, and fear, in which everyone is a target, and you’re often the collateral damage in a growing conflict among states. From crippling infrastructure to sowing discord and doubt, cyber is now the weapon of choice for democracies, dictators, and terrorists.

David Sanger explains how the rise of cyberweapons has transformed geopolitics like nothing since the invention of the atomic bomb. Moving from the White House Situation Room to the dens of Chinese, Russian, North Korean, and Iranian hackers to the boardrooms of Silicon Valley, David reveals a world coming face-to-face with the perils of technological revolution—a conflict that the United States helped start when it began using cyberweapons against Iranian nuclear plants and North Korean missile launches. But now we find ourselves in a conflict we’ve uncertain how to control, as our adversaries exploit vulnerabilities in our hyperconnected nation and we struggle to figure out how to deter these complex, short-off-war attacks.

David Sanger
The New York Times

David Sanger is the national security correspondent for The New York Times as well as a national security and political contributor for CNN and a frequent guest on CBS This Morning, Face the Nation, and many PBS shows.
CREDITS, SOURCES & THANK YOU

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2. PMJDY website
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4. NPCI website
5. Ispirit Foundation website
6. TRAI website
7. MEITY website – Personal Data Protection Bill 2018
8. Tanuj Bhojwani
9. Siddharth Shetty
10. Pramod K Varma (@pramodkvarma)
11. Srinivas Kodali (@digitaldutta)
12. V. Anand (@iam_anandv)
13. Malavika Raghavan (@teninthemorning)
14. Elliot Alderson (@fs0c131y)
15. Venkatesh Hariharan (@VenkyHariharan)
16. Newspapers – The Hindu, Economic times, Dailyo.in, scroll.in
17. Youtube.com
18. Slideshare.com
19. Aarush Thakur
20. Anil Shankar Dani
21. Many others who shaped my understanding during research on this topic but can’t recollect to list them down. Thank you to you all as well.