

LessCash Economy

Opportunities and Challenges

A freewheeling, totally "Unofficial" paper by Rajesh Aggarwal (December 2016)

This paper is also available at www.egovernance.guru/publications along with my other papers.

After 8/11, we are on the plane with a one-way ticket to cashless destination. This informal and unofficial paper crystallises some basic ideas which I have been speaking at various conferences now for more than five years. In October this year, I gave a talk to about 380 officers of 2016 batch of various All India services in Mussoorie Academy where the underlying theme was about going cashless. Just a few days before 8/11 when demonetisation was announced, I gave a talk to about 150 MBA students in IIT Delhi, and mentioned that the country would be truly cashless when you can pay the barber and vegetable vendor by Paytm. Who knew that it won't take years or months but a few days for a big push in this direction.

We will focus on Payment Systems in this paper. Later, I will bring out another paper on other new-age Financial Services – Credit, Insurance, Share Market etc.

FLIPPING THE CHARGES

First big thing to do is to flip the charges levied by banks and portals on cash v/s non-cash transactions. Till today, cash transfers, deposits and withdrawals attract no commissions while electronic or non-cash (cheque, demand draft) attract hefty commissions. At Railway counter you pay only Rs. 200 cash for ticket costing Rs. 200 even though the cost to the Railways of maintaining that building, of the ticketing staff, and of cash handling may be Rs. 50 per transaction. On the other hand, on the IRCTC website where the actual transaction cost to Railways maybe less than one rupee, the Rs. 200 ticket may cost the customer Rs. 210 due to Rs. 10 convenience charges taken by the portal. Hence we need to totally flip the model.

1. **Banks should levy charge for withdrawal of more than 5,000 Rupees (further limited to 4 times in a month) from bank counters, ATMs or microATMs. This could be flat 1%, to discourage cash in the system. In rural areas, this could be 0.5%. Same formula should apply when depositing the cash at a bank counter or Cash Deposit machine or the microATM. Same formula should apply on a cash based money transfer transaction, on mobile wallet recharge/cash-out and on some PPI card recharge by cash etc.**
2. Presently people are talking about POS and microATM in interchangeable fashion. Actually there is big difference between the two. There are more than a million POS machines with merchants in the country, sponsored by some bank. Debit/Credit/prepaid cards, or mobile based virtual debit/credit cards can be swiped/touched for a transaction. **We should encourage merchants to allow cash-out of up to Rs. 5,000, with commission of 1% subject to min/max limits of Rs. 20/50** to the merchant as cash handling costs and extra 1% subject to similar limits to other stakeholders (sponsor bank, VISA etc.)
3. **MicroATM carried by Bank Correspondent is similar looking to POS, but with a totally different purpose. It allows the BC to act as a mini, portable bank branch, enabled to open bank accounts, know/print mini-statement, make deposits and withdrawals etc. Like ATMs, some numbers of cash withdrawals may be free of charge. RBI and IBA need to clarify the charges, free number of withdrawals, and upper limit of withdrawal, otherwise there is possibility of poor people being cheated.**
4. **Some non-cash non-electronic methods like Cheque, Demand Draft, Banker's Cheque, Pay Orders etc. will remain in vogue, but they should also be subject to levies, maybe to 0.2% subject to a minimum of 5 rupees because transaction cost (printing, issue, reconciliation, bouncing, disputes etc.) to the banking system is high.**
5. Bank Challans are one of the most inefficient tools of money collection, but many government departments (PDS Ration shops/transporters, admission or exam fees etc.) force citizens to go to banks, deposit cash, get three copies of bank challan, deposit two and keep one, and so on. **High time that Bank Challan system is scrapped.**
6. Lot of Government receipts comes by **Revenue Stamps, Court Fee Stamps, printed Stamp Paper or Franking** etc. This is highly inefficient, easily faked, very high

commissions to intermediaries (stamp vendors, SCHIL etc.). Maharashtra Finance department and Stamp Registration department worked with several banks (notably IDBI, others joined later), for **e-SBTR (Electronic Secure Bank and Treasury Receipt)**. This is printed like traditional stamp paper with almost currency note features at Nashik Currency Printing Press, issued to banks, and banks print transacting details and amount on this paper. It is **online verifiable** by any department or person getting this e-SBTR. This can save hundreds of crores of rupees paid to intermediaries, and many more hundreds of crores in eliminating fake stamps and fake stamped papers.

7. As Cash movement is disincentivised, it is essential that electronic ways are incentivised. Presently charges are exorbitant – Credit card charges can be 2-3%, Debit cards and UPI charges are around 1%, Wallet charges vary from 2-4% etc. We need to dramatically lower these charges.
8. Fully electronic payment systems – NEFT, RTGS, IMPS, UPI, Mobile wallets, POS transactions etc. cost very little to the banking system transaction wise. However, all the stakeholders do invest in hardware, software, manpower, dispute resolution mechanisms etc. Hence some commission must be levied and it cannot be made totally free. I propose that:
 - I. **In case of Credit cards, there should be an upper cap of 1.5%, and it is for merchant to decide whether to take the hit or pass it on to the customer.** Law should make it clear that customer will not crib if merchant passes on this charge to the customer, as it is the customer who is benefitting by delaying his actual pay-out by about 50 days. **I hope NPCI comes with RUPAY credit card soon, with 1% commission, to bring strong but not insane competition.**
 - II. **In case of Debit cards, Mobile Wallets, NEFT, RTGS, IMPS, UPI etc. charges should be maximum 0.2% subject to maximum Rs. 5 per transaction.** Actual cost to the banks and other payment players is very little. I am sure NPCI RUPAY Debit cards, SBI BUDDY wallet etc. can immediately announce these rates without waiting for RBI notification.
9. Above para refers to merchant transactions. On various Private or Government **portals, similar charges should apply for online payments.** In fact, government utilities and departments should not pass on banking costs to citizens for online payments (except for credit cards), as they save huge money in avoiding setting

up cash counters. Anyway, cash collections (by electricity board counters, or OPD charges at hospitals or wherever) will ultimately be deposited at bank counters who will charge 1% cash handling charges as indicated earlier. Thus, **government departments and utilities should not pass on banking charges on electronic transactions to the citizens, but instead levy 2% cash handling charges if payments are by cash.**

10. The movement of electronic money from a bank/wallet to another bank/wallet should also be at a very low cost, as mentioned in above para. These very low charges should apply regardless of the transaction being done over UPI (i.e. common interconnect platform) or otherwise.

ABOUT BANK CORRESPONDENTS (BC)

Instead of setting up Bank Branches and ATMs, many banks have appointed Bank Correspondents. They act as mini bank branch and as portable ATM.

1. As the microATM connects to banks' CBS system, security of microATM hardware and software and network connection is important. I hope that RBI enforces this. One hears stories of BC business sold by the individual to some other individual, hence it is important that RBI and IBA enforce a proper recruitment and training regime, and also **enforce Aadhaar based biometric eKYC login everyday** into the bank CBS by the BC. This will reduce many malpractices.
2. RBI says that about 3 lakh BCs are functioning, but it is not based on any hard data. Many BCs functioning in urban areas are just opening bank accounts and/or doing money transfers. The Rural BCs having proper microATMs (or Desktop based solutions) are less than 1 lakh. Some BCs bring their microATMs to cities rather than operating in their villages. Hence **GPS chip with geo-fencing** may be mandated to force these BCs to operate in the villages allotted to them. IBA (Indian Banks Association) should have a **real-time dashboard** of what the BCs are doing.
3. RBI has rightly extended the date to June 2017 for banks to **put biometric Aadhaar authentication system in acceptance infrastructure (that is, ATMs, microATMs, POS machines)**. Card+PIN or Aadhaar+Finger can be used for authentication. Some banks **store Aadhaar number in the Card**, which can be swiped coupled with biometric auth. This saves the hassle of remembering 12 digit Aadhaar number

and typing it on the machine (ATM or microATM or POS). More and more banks may like to do this as it is faster, less error-prone.

4. Banks spend at least 15,000 rupees per month in capex/opex of an ATM but are unwilling to **pay minimum 5000 rupees per month to the BC**. Banks insure the ATM money but do not provide any **insurance to the money carried by BC**. RBI has guidelines for this, but all banks should follow this. Each BC should be allowed to carry **at least 50,000 rupees on a day**.
5. ALL banks need to allow **interoperable transactions on microATMs** (just like ATMs). This aspect needs to be ensured, as at present some banks are not fully committed to this.
6. About one-third BCs are directly hired on contract by the banks, but two-thirds are hired through **intermediary companies** (FINO, Vakrangee, Zeromass, TCS etc.) Some BCs complaint that one-time charges varying from 15 to 50,000 rupees are taken by these intermediaries, along with 30% of transaction commissions. **This needs regulation, auditing and cleaning up**. Not all intermediaries are bad – some do good branding of BC outlets, exercise good supervision, give good software and dashboards, and bring lot of value added services.

CONNECTIVITY ISSUES

Modern day banking works on online software, and no transaction can happen in a bank, ATM, POS or by Mobile if Internet is not functioning. Even bank branches in Metros sometimes suffer internet outages. Situation in smaller cities and villages is much worse.

1. CBS (Core Banking Software) offered by software giants to our banks is bloated, heavy, bandwidth-guzzler. Very few banks have developed lite-weight versions with lesser functionality but less bandwidth hungry applications. One CMD of a private bank told me that software in her rural branches works well even with limited 64 kbps VSAT able to handle 7 terminals. ALL banks, especially our Public-Sector banks and Rural Cooperative banks need such **lighter versions of CBS**.
2. Almost half our BCs suffer from unreliable internet, and more than 5000 have no internet connectivity. NABARD is operating 2000 crore rupees **Financial Inclusion Fund (FIF)**, from which Solar Power plus VSAT was planned. This is however not

really taking off. VSAT is bulky, and BC locations are fuzzy due to almost 30% attrition rate per year. Now my friends in ISRO tell me that latest satellites allow very small sized, portable VSATs. **Can our banking system deploy 50,000 rural BCs on branded motor-cycles with portable VSAT, microATM and printers? If this is done, expansion of ATMs and Bank Branches in our rural areas may not be needed.**

3. Some banks like PNB are experimenting with **Hybrid application** on Smartphone, which works on data, but switches to basic functionality if internet conks off but SMS based connection is still available.
4. Bangladesh is good example of use of **USSD**. Our ***99#** function on basic feature phones has not taken off due to very high costs levied by Telecom companies (which TRAI has now forced them to reduce to 50 paise), and lack of commitment by many banks. NPCI also needs to devote more resources on polishing and simplifying this. Failure rate presently is high, due to confusing multiple menus, and due to unpolished banking interconnect with NPCI on ***99#**. In rural areas, where Internet does not work, or where people don't have smartphones, this kind of **SMS based banking** can be very useful.
5. Many of us have used **Octopus or similar cards** when travelling abroad. These work across public transport like trains, buses, boats or even at many other places. In India, many **Metro rail companies use prepaid cards which work in OFFLINE method. Wherever there are long queues like our trains, buses, toll booths etc., using online authentication or use of debit/credit cards will take long and delay the long queues.** Thus, prepaid cards which can work offline across multiple places, even shops, can really be useful. Hope Team NPCI introduces such cards without waiting for transport department or any other department. Build the road, the users will come. Our public transport, taxis, autos, vegetable vendors, many will lap it up. **The acceptance infra and recharging infra will be low priced due to mass volumes. I strongly urge NPCI to launch such prepaid, offline cards.**

DIGITAL AND FINANCIAL IMPERIALISM AND ROLE OF NPCI

USA has Microsoft, Apple, Google, Amazon, Facebook, Uber, Airbnb, VISA, Master, IBM, HP, Dell etc., and China has Alibaba, ANT, Didi, Baidu etc. Though Indians have always welcomed the best global companies and culture, but there is real danger of India getting a raw deal if we do not encourage our homegrown solutions in eCommerce and Fintech.

1. We must hail NPCI (National Payment Corporation of India) which gave more than 25 crore RUPAY debit cards to Jan Dhan account holders. Bharat Payment System and UPI (Unified Payment Interface) can be real game changers, bringing interoperability, and sane rates. I request the Government of India to allot **minimum 100 crore Rupees Grant to NPCI to enable them to expand their capacities and invest in R&D.**
2. IMAI and PCI are already lobbying for **Mobile Wallets like Paytm, Mobiquik, Freecharge to be connected to the UPI platform.** I strongly support the move, but subject to it being limited to KYC wallets. Otherwise, we may see money laundering and other malpractices.
3. **New Payment Banks (Airtel, Paytm, SBI-JIO) also need to be connected to UPI.**
4. **Postal Network also needs to be plugged into UPI,** without waiting for them to become payment bank (which may take 3-6 months).
5. I have already talked about very minimal charges when moving money electronically – so UPI will be real-time, high-volume, very low cost, very interoperable payment system.
6. Perhaps NPCI is already working on a system to enable a **merchant display just one QR code,** so that customer with any Debit/Credit card, or Mobile Banking App or Mobile Wallet can pay to the merchant. At present, merchants are being wooed by different players, and the systems are not interoperable. We hope that this will be non-issue by March 2017.
7. With all this, **NPCI should become the Heart and Brain of our Payment System.** Presently, it only captures “heartbeat” of ATMs, checking if they are turned on. I have requested NPCI Team to think about capturing Cash-status of ATMs, active

status and location of microATMs and POS machines and maybe Bank counters also. Imagine NPCI giving the Public a real-time App indicating **status of all these cash-out points and electronic payment locations on a GIS based Mobile App.**

8. We need **MAKE IN INDIA** in banking systems hardware, software and networking components. We need **KEEP IN INDIA** with respect to Data. Perhaps it is time to ask all players (including VISA, Master, AMEX) to ensure that **Indian KYC and Transaction Data remains within India.** The servers, storage, cloud management tools, everything needs to be in India. Snowden Leaks should have resulted in more awareness on these issues.

GOVERNMENT PAYMENT AND RECEIPTS

Government has to lead by example in reducing its own usage of cash – both on receipt side and payment side.

1. I have already discussed many Government Receipts – be it utility bills, municipal taxes, other taxes, fees etc. Cash receipts, cheques, Demand Drafts, Pay Orders, Bank Challans and Stamps needs to be discouraged, and various electronic payments like e-SBTR, GRAS, and payment gateways need to be encouraged. **On Cash receipts, 2% user charges should be imposed, while on all electronic payments, bank charges should be borne by the government.** Many electricity boards in states are reducing their cash counters and involving CSCs (Citizen service centres) as bill dispatch and bill collection centres. CSC operator collects cash from citizens but gives computerised receipts to citizens and deposits the cash into bank account of electricity board at the end of the day. In a prominent government hospital in Mumbai, when we computerized the cash counter collecting OPD and diagnostic tests fees, the daily collection increased 3 times. In Bengaluru, introduction of traffic challans on blackberries increased collection a great deal. **Thus, in receipts, computerisation of cash collection points and enabling electronic payments must be done.**
2. Now about Government portals. My young friends in education start up **codingninjas.in enabled payment gateway on their website in 4 hours flat using Razorpay!** If a government department or a district collector wants to enable electronic receipts on its website, it may take years. Tenders have to be floated, decision taken on who will take the hit on bank commission charges – department

or citizen, and how to integrate the incoming payment into the correct “budget head and sub-head”. In Maharashtra, five years ago, Accounts and Treasury Department (I was Secretary) and NIC Pune launched **GRAS portal. (Government Receipt Accounting System)**. Many departments and Corporations in Maharashtra use this, and the system has been adopted in many other states. Paperless, electronic Reconciliation with Treasuries, budget-heads, SBI, RBI and CGA is an important aspect of GRAS. However, can we make GRAS as simple a plug-in as Razorpay or similar private gateways? **Can ALL our government departments and Corporations and Municipalities which collect fees of some kind enable electronic payment gateways by March 2017?**

3. On Payments, out from Government, we must force direct bank transfers to employees, contractors, citizens (beneficiaries of various schemes) and businesses (refund of taxes etc.). The cheque system is inefficient, fake-prone, corruption-prone. **On payment side, cheques are as pernicious as cash and must be eliminated. All the cheque books in our Treasuries, with PAOs (Pay and Accounts Officers), and with DDOs (Drawing and Disbursing officers) need to be destroyed and banned.** Central government is encouraging DBT (preferably Aadhaar based). It has recently issued instructions that all payments above 5000 rupees have to be electronic. The **Imprest Money (petty cash) available with DDOs must also be moved into mostly electronic payments.**

मैं भी भारत (I am also India)

Let us not forget that majority of India still lives in villages and urban slums.

1. As Jan Dhan Mission Director, one particular letter I will always remember is the one which said – “Our village has a bank branch, but please give us an ATM, because the **ATM does not insult us, or make us feel small**” - **ATM हमारी बेइज़्ज़ती नहीं करती.** Massive sensitisation of banking sector is needed.
2. In urban slums, rural areas, and remote tribal areas, the issues are of lack of internet/mobile connectivity, illiteracy, lack of English knowledge, and lack of training/awareness. Many Indians may be illiterate or not know English, but they are extremely tech savvy, **provided the tech is simple, like using EVM** (Electronic Voting Machine), or like using Mobile or even WhatsApp. So, our Mobile Apps and

UPI must take care of this simplicity aspect. I am happy that **SBI BUDDY** is moving in this direction. It is available in **13 Indian languages**.

3. It is not uncommon for people in remote tribal villages to **WALK 30 KILOMETERS** to the nearest bank branch. There are no BC or ATM around, due to lack of viability and/or lack of internet. As mentioned earlier, we need 50,000 BCs on motorcycles with portable VSAT.
4. Probably JIO will reach where BSNL has not. But again, many remote villages will still be left out.
5. I have earlier mentioned about lighter version of CBS software in rural branches, so that on low bandwidth or even on VSAT, the branches can function.
6. RBI has mandated opening some percentage of branches as Rural branches. We see 10 different banks setting up branches in same village situated on Highway as it is convenient to staff. Other villages suffer. State Level Bankers Committees (SLBC) need to undertake a **de-clustering drive so that there is fair spread of rural bank branches**.
7. **Cooperative banks and Postal system** will continue to play a very important part in rural economy. RBI, IBA and NPCI need to bring them on par with other commercial banks as far as payment system is concerned. Their ATMs and Debit Cards should be interoperable and they should be allowed to plug into UPI, subject to proper security audits.

NEED TO GET OUT OF BANKERS MINDSET

Due to a very strong banking system and a very strong central bank (RBI), with almost no lateral entry from eminent persons from other fields, new-age payment systems like telco-driven payments have been stymied. Career Bankers dominate RBI, IBA, NPCI, CERSAI etc. These organisations need fresh blood and talent from other sectors (especially IT) at highest levels. How many GM IT in banks have IT background? This banking mindset cuts much deeper, as points below will illustrate.

1. Traditional banking channels (RTGS, NEFT, remittances) are expensive and slow; telecom channels (mobile money, mPesa) faster and less expensive; internet

based channels (bitcoins or blockchain based digital currency zipping over internet, undiminished in value) much faster and almost zero cost.

2. Some African countries like Kenya had great success with **telecom driven mPesa**. But our mobile wallet companies had tough time with banking regulations. Post 8/11, however, the scene has changed dramatically.
3. **New Payment Banks may provide world's best payment system, provided RBI gives them a light-weight regulation regime.** Asking them to set up all regular banking systems minus credit would be a huge mistake. They need regulation from grounds-up, designed for new-age. We need to totally redefine and reimagine – what is a bank, what is a branch, what is a passbook, what is a chequebook, what is KYC, what is a transaction. Why do we need a wet (ink) signature if the customer does not need a chequebook? In that case, the whole bank account opening procedure can be made paperless, using Aadhaar based biometric eKYC process. **Luckily RBI has allowed Payment Banks to use eKYC.** Reliance JIO has given more than 5 crore SIM cards based on eKYC. Hopefully, the Payment Banks like Airtel, Paytm, SBI-JIO will use only eKYC while opening new bank accounts, or shifting from telco/wallet to the bank.
4. Despite claims of CBS resulting in **anywhere banking**, most of the banks levy hidden charges on non-Home branch. If I have a bank account in Mumbai, I should be able to walk into any branch of this bank anywhere in the country, without any additional charges. In reality this is not so. Getting a cheque book, depositing cash in Cash Deposit Machine or Recycler, changing the address or some other details, closing the bank account – all this is difficult or expensive if you are in some other branch instead of your “Home branch” where you originally opened the bank account. Try to close your bank account in Mumbai after you get transferred to Delhi. It is a nightmare! And this is one major reason of individuals having **multiple bank accounts**, many of them dormant.
5. **Our Central Registry CERSAI is depending on existing KYC data with banks, rather than using Aadhaar number as the basic deduplicating factor.** This will result in as bad a database as presently exists in banks. Even PAN number has too many not-so-reliable entries or multiple entries. High time that Aadhaar serves as KYC for Banks, Insurance, Pension, Investments in Share Market and Land etc. **All Regulators (RBI, IRDA, PFRDA, SEBI, FMC etc.) need to adopt eKYC as the sole reliable factor.** In case a citizen does not opt for Aadhaar, we need to enforce a strict alternate mechanism for a very strong, rigorous, unique identity check.

6. **Aadhaar can be financial address, though at the moment, it is riding on top of a bank account.** More thought needs to go into this.
7. **White label ATMs and white label BCs** are not really taking off as traditional banking mindset is at work. (How can non-banking companies do banking stuff?)
8. **Does our Payment and Settlement Systems Act give too much powers to RBI, many of which should be with the Executive (Government), and some with Legislature (Parliament)?**
9. **Bitcoin** use is increasing in India. **Can RBI launch our own homegrown Digital currency based on blockchain?** The issue and movement of this currency may be allowed only to customers who have done Aadhaar based biometric eKYC. This digital currency can zip over internet without any kind of commissions.

CONVENIENCE v/s SECURITY AND CYBER FRAUD ISSUES

1. I have written more than six dozen judgments as Adjudicating Officer, Maharashtra under IT Act, which have got wide coverage in media. These pro-consumer and pro-privacy judgments against Banks and Telecom players are now often cited in cyber-jurisprudence discussions. Most of these judgments relate to netbanking and ATM frauds.
2. My judgment in Nagpur Petrol Pump case is about a rogue employee using dummy POS machine to clone the cards. Who will compensate the citizen – VISA or bank (but which bank?) or the Petrol Pump owner or the Oil Company?
3. Santosh Jalukar v/s Bank of Baroda case judgment shows that netbanking frauds reported are a tiny fraction of what actually occur. Police personnel in the cyber police stations are also not fully trained. Many people simply don't come to know that a fraud has occurred. How many times in last one year have you scrutinised your passbook thoroughly and checked all the debit entries?

4. Many judgements, especially Sanjay Dhande judgment, show that **behind many bank frauds is the role of fraudster obtaining duplicate SIM card of customer** with incredible ease. DOT (Department of Telecom) and TRAI need to enforce strong SOP (Standard Operating Procedure) for issue of duplicate SIM card. **Can they mandate Aadhaar based biometric eKYC before issue of duplicate SIM card?**
5. If your bank account is in Delhi, and you are in Mumbai when you start getting SMS alerts about your credit card being used by a fraudster for shopping in Hyderabad, where do you lodge an FIR? You will be made to go around and around.
6. Even if you manage to lodge an FIR, is the police trained in investigating such frauds? Do they have proper tools (hardware and software)?
7. Does your bank respond to you at all, and is their Fraud Investigation Unit mandated by RBI functional?
8. If the bank gives IP addresses used by fraudsters to the police, how long does it take the police to obtain location of the criminal?
9. If money is withdrawn from ATM by the fraudster, is the ATM CCTV camera functional?
10. Are our cyber forensic labs well equipped? It can take 4-5 years before the police receives forensic report.
11. Special cyber fraud courts are needed. Are our civil court judges trained in handling cyber frauds?
12. Are our Adjudicating Officers trained and are they hearing cases? How many of our State IT Secretaries know that they have powers of Adjudicating Officer under the Information Technology Act 2000? Has MeITY conducted a single workshop for Adjudicating Officers since 2000 when the IT Act was passed?
13. For many years, the Cyber Appellate Tribunal is not functioning due to vacancy of Chairman.
14. While security and safety is paramount, we need to balance convenience with safety. Many mobile wallets are easy to use as they use single factor authentication. That also introduces a weakness in safety. For many popular

wallets, if a fraudster obtains your duplicate SIM card, he just has to use Forget Password feature on the Mobile Wallet App, get OTP on the duplicate SIM card, log into your account, and he can empty out your wallet.

15. **Perhaps we need to enforce 2-factor-auth for login, and change of password etc.**

16. I feel that 4 transactions up to 1000 rupees in a day may be allowed on Mobile Wallet and UPI with one-factor-auth, otherwise 2-factor-auth should be required. **Aadhaar based biometric auth on mobile is a beauty – it is a single-click 2-factor-auth!** I hope that many mobile manufacturers will bring out in near future models having IRIS camera or Aadhaar compatible fingerprint sensor.

17. Our banks need to do real-time big-data analytics. Presently, even the most basic analysis of card transactions is not being done: for example, transactions like a debit card physically used in Delhi at 10 a.m. and two minutes later in Bihar or Russia are not flagged.

18. Financial Literacy about Safety aspects: I know many colleagues in IAS who give their Debit Cards and PIN numbers to peons to withdraw money from ATMs. Open the drawer of any CA in the country and you will see dozens of Digital Signature dongles wrapped in rubber band along with a slip of paper with username, password, PIN number of their customers for filing Income Tax returns. Obviously our rural people and illiterate people and elderly people can fall prey to fraudsters more easily. **A big awareness drive is needed.**

Welcome to the Wild, Exciting, Efficient world of new-age cashless transactions!

ABOUT MYSELF (Rajesh Aggarwal)

Did B.Tech. in Computer Science from IIT, Delhi (1983-87), before drifting to IAS (Indian Administrative Service) in 1989. In IIT, my B.Tech. Thesis was on Natural Language Understanding, and my main interests were Algorithms and Artificial Intelligence.



During Field postings (1991-1998) after joining IAS, did a few small IT projects with help from district NIC Teams. But advent of Internet in Government offices starting around Y2K changed things. During my stint at Election Commission of India, New Delhi (2003-2007), I developed lot of fuzzy matching techniques to dedupe the voter lists, worked with large databases (700 million voters and 500 million photographs) in more than a dozen Indian Languages, executed Photo Rolls project (now you see your photograph printed in the Voter List), and convinced Delimitation Commission to make new Assembly and Parliament boundaries using GIS Maps from Census of India.

From 2007-2009, I managed National Internet Exchange of India (NIXI), where we dramatically decreased Domestic Internet traffic packets going outside the country, and increased .IN domain names considerably, and introduced forward looking policies in both the fields. We also brought NIR (National Internet Registry) to India to allot IPv4 and IPv6 addresses.

Back to State Government in 2009, during my two-week additional charge of Social Justice department, we could issue Government orders regarding scholarship money to kids going into their Bank Account directly. Thereafter, during a one-year stint as Secretary Accounts & Treasuries, my focus was on making treasuries cheque-less, going totally electronic on Receipts and Payment sides.

My tenure (June 2011 to January 2015) as CIO of the State saw Maharashtra rising to the top of eGovernance ecosystem in the country. It is now #1 in Aadhaar, number of CSCs, electronic payments and receipts in the country, and very strong in eTendering, eOffice, use of Cloud, IPv6 etc. These eGov initiatives have bagged more than 300 National and International Awards.

I have written more than six dozen judgments as Adjudicating Officer under IT Act, which have got wide coverage in media. These pro-consumer and pro-privacy judgments against Banks and Telecom players are now often cited in cyber-jurisprudence discussions.

I have also been lucky to get Aadhaar innovations Award from Hon' Prime Minister, National e-governance award, Indian Express IT Award, DataQuest Editor's Choice for CIO, PC-Quest C-change award, and in 2014 chosen amongst Global 100 CIOs by Computerworld USA.

In January 2015, I moved to Delhi in Government of India as Joint Secretary (Financial Services), and Mission Director of Flagship Initiative of Financial Inclusion (Prime Minister Jan Dhan Yojana). Since June 2016, I am Joint Secretary in Ministry of Tribal Affairs. A full circle in Digital, Financial and Social inclusion in last 5 years!

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