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Creating an Enabling Digital Ecosystem: Issues and Challenges in Financial Inclusion

S. Ananth[*]
Adjunct Faculty
Institute for Development and Research in Banking Technology
Hyderabad -500 057
sananth99@gmail.com

Charan Singh[$]
RBI Chair Professor
Economics & Social Science
Indian Institute of Management Bangalore
Bannerghatta Road, Bangalore – 5600 76
Ph: 080-26993818
charansingh@iimb.ernet.in

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[*]S. Ananth (sananth99@gmail.com) is an Adjunct Faculty, Institute for Development and Research in Banking Technology, Hyderabad.
[$]Prof Charan Singh is Reserve Bank of India Chair Professor in Department of Economics, Indian Institute of Management, Bangalore.
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Abstract

Technology adoption is dramatically altering the way we live and work on a daily basis. The nature, pace and impact of this technology adoption at the everyday level is often overlooked. Recent experiences indicate that building on various public and independent initiatives provides a unique opportunity to move away from cash to inclusive cash-lite initiatives, especially in rural areas. Banking and Payments success stories in Kenya and Tanzania hold promise for many developing countries. This paper suggests that despite formidable challenges, the nature of present day rural society offers immense potential for the creation of a digital ecosystem, which may not be as difficult as perceived. We offer suggestions on building this digital ecosystem based on the present economic organisation of rural life, the recent expansion of banking system and other successful technology initiatives by various stakeholders in the government and private sector.

Key words: Financial inclusion, digital banking, e-banking, JAM, Digital India

Introduction

Technology adoption is dramatically altering the way we live and work on a daily basis. The nature, pace and impact of this technology adoption at the everyday level is often overlooked. The success of any economic transaction is dependent on the ability to quickly assess counterparty risk combined with the ability to quickly accept or complete payments. Recent technological advances highlight the endless possibilities and benefits that accrued on both these counts thereby giving a fillip to economic activity. The benefits of electronic payments and the transformation that they have facilitated to the broader economy are clearly visible, especially in the remote rural areas. The spread of banking system, its modernisation, improvement in communications, establishment of business correspondents of banks and other changes like increased use of harvesters have triggered rapid changes that include shortening of the trade cycle in rural areas. The increased use of mobile internet, spread of e-commerce, localisation of content available on the Internet and investments in technology make the conditions conducive for encouraging electronic-transactions. Investments in technology by the private and government sector make the creation of this ecosystem a felt need.

Creating a Digital Ecosystem

The emphasis on digital banking and technology adoption is not new. Various reports and bankers have constantly drawn attention to the need and advantages of large-scale digitisation and the push towards electronic transactions. Rangarajan Committee (2008) was one of the first to stress the need to extend the reach and scale of banking by leveraging technology to open new channels beyond the traditional banking network. It opined that adoption of appropriate technology would enable the branches reach out to the customers instead of the other way round. It suggested funding support for promotion and developmental initiatives, through a Financial Inclusion Technology Fund that would facilitate better credit absorption and for application of technology for inclusion. It was one of the first to suggest encouraging small players and integrate them with the national system[1]. Nachiket Mor Committee (2014) reports offers various suggestions on encouraging technology to deepen banking penetration and lending to certain consumer segments and draws attention to the need for RBI to develop a robust legal and

[1]"Report of the Committee on Financial Inclusion" NABARD, 2008 (https://www.nabard.org/English/report_comfinancial.aspx) Website last visited 03 June 2015.

regulatory framework around data generated in various transactions and to defray a part of the costs. In order to achieve the goal of maximum financial inclusion and increased access to financial inclusion the committee proposed the following measures: provision of full-service electronic bank account; distribution of Electronic Payment Access Points for easy deposit and withdrawal facilities; provision of credit products, investment and deposit products, insurance and risk management products by formal institutions[2].

The scope of digital transactions will expand with the increased integration of Jan Dhan, Aadhaar and Mobile (JAM) trinity. The *Economic Survey 2014-15* opines that it will facilitate effective targeting of public resources and "allow prices to be liberated to perform their role of effectively allocating resources" and boosting growth[3]. The need for better targeting needs to be contextualised because of large fiscal cost (Rs.378,000 crores or 4.2 per cent of GDP) incurred on select benefits delivered by the government. There is an added urgency since a large number of these benefits may accrue to the more fortunate sections and due to complexity of the delivering them[4]. JAM has the potential to facilitate better targeting of subsides through cash transfers so that they reach the needy, with minimal leakages and faster delivery of benefits. The ability to deliver benefits through JAM has increased exponentially in the past few years since there are 21.38 crore Jan Dhan Accounts[5], 98.56 crore Aadhaar numbers[6] and 101 crore mobile phones[7].

The importance of the expansion of JAM trinity goes beyond delivering welfare benefits. It offers a unique opportunity to bring about a paradigm shift in the way banking and financial services are delivered to customers – not just the well off individual customers but across socio-economic segments and to small businesses. The digital footprint and banking transaction history means that a customer's track record can be analysed quickly giving the banking system

[2]"Committee on Comprehensive Financial Services For Small Businesses and Low income households", Reserve Banking of India, 2014. Available at: http://rbidocs.rbi.org.in/rdocs/PublicationReport/Pdfs/CFS070114RFL.pdf. Website last visited 04 June 2015.
[3] *Economic Survey 2015-16,* Volume I, p.21 (http://indiabudget.nic.in/es2014-15/echapter-vol1.pdf - website last visited 01 April 2016).
[4] *Economic Survey 2015-16,* Volume I, p.22.
[5] As on 23 March 2016 (http://pmjdy.gov.in/account - Website last visited 1 April 2016)
[6] As on 29 February 2016 (https://uidai.gov.in/images/news/ranking_of_states_as_on_29_feb_2016.pdf - Website last visited 1 April 2016)
[7] As on 31 January 2016 (http://www.trai.gov.in/WriteReadData/PressRealease/Document/PR_TSD_Jan_2016.pdf - Website last visited 1 April 2016)

the opportunity to react quickly to design services quickly. More importantly, user behaviour can now be analysed using advanced analytics resulting in better products and service delivery by financial service providers and government departments. JAM offers an opportunity to convert the mobile phone into a powerful secured platform to conduct various operations at the convenience of the user. The use of alternative channels have to be seen in the context of other measures including those like e-KYC, growing use of smart phones, spread of mobile internet, faster network connectivity (like 4G) and efforts by RBI to encourage the Banking sector to use of alternative framework for credit appraisals that thrive on using technology including credit history check through credit information companies, central registry of securitisation, asset reconstruction and security interest, information sharing among lenders and peer monitoring[8]. Thus, for the first time in history JAM offers immense scope for business expansion to the banking sector by facilitating better data capture, analysis and usage leading to the creation of more customised suite of products while creating a robust digital ecosystem that reduces the need to physically carry cash while further helping banks that have already put in place a lending automation processing systems[9]. Globally, automated loan appraisal and underwriting have increased in the past few years with some start-ups preferring to use algorithms that use various data points to FICO scores[10]. The data capture and analysis that JAM facilitates could offer lenders more incentive to lend because they will have more information about the customer's behaviour to analyse – something that is not possible at present. Further, technologies such as Blockchain along with peer-to-peer payments using NFC (elaborated later in the paper), offer new vistas for the expansion of the banking sector. It offers an opportunity to automate large number of activities that are now require human/manual interventions.

In the above context, there is a need to draw attention to various other innovative initiatives suggested over the past few years. These include television banking and mobile banking. The use of television banking[11] is one such probable alternative banking channel that deserves attention, especially in the context of the spread of banking reach through Jan Dhan and the penetration of

[8] *RBI Annual Report 2015*, p. 73

[9] http://www.sysarcinfomatix.com/in/images/news_events.pdf (Website last visited 01 April 2016).

[10] http://www.bloomberg.com/news/articles/2012-01-23/startups-size-up-loan-candidates-with-algorithms-rather-than-fico-scores (Website last visited 1 April 2016)

[11] Charan Singh, Advait Nagesh, Alai Naman Jhawar, "Why Not Television Banking", *The Hindu Businessline*, 23 March 2015, (http://www.thehindubusinessline.com/opinion/why-not-television-banking/article7024699.ece). Website Visited on 3 June 2015.

television in the country. Television banking offers an opportunity to leverage the two-way communication property, associated with digitalisation and existing reach to provide banking services such as balance enquiry, teleshopping and account transfers among other activities. The reach nearly 75 crore reach of the Indian television is a special attraction, especially in remote rural areas.

A larger digital ecosystem has the potential to deploy a combination of devices and channels linked to a broader network of users to encourage digital transactions. The creation of this digital eco-system may not be as difficult as often perceived. This assertion is based on anecdotal field-evidence gathered as part of our present work-in-progress, which indicates that most of the rural households spend their money in a radius of about 25 square kilometres. The economic-geography of a large part of India is that most villages are within a radius of about 5-25 kilometres from a town though occasionally, the nearest large town could be in a neighbouring State. The livelihood pattern of an overwhelming number of rural households includes the buyingof provisions, fertilisers or other inputs in the local shop or the nearest town, paying for various services including loan instalments to banks, gold loan companies, informal moneylenders, school fees and saving small amounts in informal or pyramid schemes among others. At times, the money flows through the formal sector by way of electronic payments but returns to the cash economy once it reaches the customer. Though expenditure on the above pattern is common, there are exceptions. These exceptions include repaying instalment to banks, gold loan companies, paying taxes, remittances to children to pay for expenditure related to higher education and importantly, when money is spent in the nearest small town in a neighbouring State. While money expended in the same State may not create obstacles in the creation of a digital ecosystem, it is not case with money spent in a town in another State. Presently, an overwhelming (if not all) these transactions are through cash payments including those like payments of loan instalments to the formal banking sector. The scope of the cash transactions has not reduced despite the spread of the Prime Minister Jan Dhan Yojana (PMJDY).

Thus, we suggest that the creation of a large network in the local area can create the basis for people and businesses to complete their daily transactions electronically, while the government can help by transferring all the benefits to one or a few accounts. The existence and ease of

using bank accounts in the local area means that people need not pay cash for their transactions. Instead, electronic transfers, especially if the Rupay card has inbuilt IMPS registration, will be of great use. Using in-built IMPS linked to the USSID number may facilitate ease of use for people with low literacy levels. Combining these two offers the opportunity to complete electronic transactions on the lines of mobile or DTH pre-paid card recharge could give a fillip to electronic transactions in daily chores. The benefit of the above- mentioned digital ecosystem is that it has the potential to create an "electronic-loop" wherein money circulates within the network of accounts and never leaves the bank account. The circulatory dynamics of capital indicates that ease of movement, low transaction costs and with appropriate incentives, capital will prefer to remain a part of the formal banking system rather than outside it.

The creation of a large network that can facilitate cash circulating within a larger network of accounts in the formal banking system has to be approached in the context of an acute need to reduce the dependence on cash and instead encourage electronic transactions since there is a huge cost of moving cash. RBI Annual Report points out that in 2013-14 (July-June Period), it had to spend nearly Rs.31,000 crores on printing and distributing cash[12]. Other reports point out that 87% of all transactions in 2012 were in cash slightly lower than 90% in 2007[13].

Rapid technological change in different parts of the world and the ability to access these changes within a short span of time for late adaptors offer hope. The payments segment is in the throes of profound changes in the past few years. Bitcoin has shown that like Hawala, access points with a unique identifiable number can be used for commerce and payments. Another important technological innovation is Near Field Communications (NFC) incorporated into mobile phones and contactless smart cards. A recent report from Semico Research points out that by 2020 there will be nearly 23 billion NFC chips used in a variety of applications from mobiles, tablets, ATMs to wearable devices[14]. The introduction of Apple's new mobile payments system (Apple Pay) using NFC, despite early problems is indicative of the changes that we can expect sooner rather

[12] *RBI Annual Report*, 2013-14, p.109 (https://www.rbi.org.in/Scripts/AnnualReportPublications.aspx?year=2014 Website Last visited 2 June 2015).
[13] "*The Cost of Cash in India*", Institute for Doing Business in the Global Context, p.12. http://fletcher.tufts.edu/CostofCash/~/media/Fletcher/Microsites/Cost%20of%20Cash/COC-India-lowres.pdf (Web site last visited 2 June 2015).
[14] http://venturebeat.com/2015/06/01/23-billion-nfc-chips-will-ship-worldwide-in-2020-report-says/ (Website last visited 02 June 2015)

than later. Apple's early success in the US is largely because of the number of devices that they have sold and its acceptance by 2500 banks and nearly 7,00,000 merchant locations. Other companies like Google and Samsung are experimenting with their own mobile payments systems linked to a digital wallet. These along with changes within the payment segment in India offer the possibility for the creation of a digital ecosystem. Another advance in payments is the one touch payment feature that allows quicker payments on a web browser or mobile application. All these changes offer the possibility of ease of transactions – an integral requirement for electronic transactions replacing cash.

Banking Success in Tanzania and Kenya

The success of mobile payments in Kenya and banking success in Tanzania clearly indicates that the possibility of creating a digital ecosystem cannot be dismissed as impractical. The penetration of the formal banking sector is relatively low in most African countries. In Tanzania, deploying mobile technology helped expand the scope of banking and financial inclusion. By 2013, nearly 43 percent of the adult population or 9.8 million have active mobile payment accounts[15].Internet banking transactions increased from 164,470 in 2006 to about 1.37 million by 2012 while mobile banking transactions using a SMS increased from 140,327 to 33.03 million by end of 2012. The number of registered mobile customer accounts (for payments) increased from 112,000 in 2008 to 26.87 million end of 2012. By June 2013, it had further increased to 29.12 million accounts. In contrast, the number of transactions through ATMs peaked at 80.22 million in 2010; declined to about 69.57 million by end of 2012 and were likely to have declined further in 2013[16]. This helped increase the formal sector access to about 73% of the population.

In Kenya, the number of mobile customers increased from 1.34 million in 2007 to 25.24 million at the end of 2014 while the number of transactions increased from 1.27 million in 2007 to 85.60 million by end of 2014. The number of agents/access points increased from 1582 agents at the end of 2007 to 1,23,703 at the end of December 2014[17]. The increase in mobile transactions occurred concurrent to the increase in access points thereby reducing the need to transact using cash. Resultantly, in places like Kenya, paying for taxi services and other utility bills using

[15]http://www.bot-tz.org/NFIF/National%20Financial%20Inclusion%20Framework.pdf (Web Site last visited 1 June 2015).
[16]http://www.bot-tz.org/PaymentSystem/statistics.asp (Web site last visited 1 June 2015)
[17]https://www.centralbank.go.ke/index.php/retail-payments-2/mobile-payments (Website last visited 1 June 2015)

mobile payment service providers is a part of daily chore. In Kenya, the growth of mobile payments led to an overall growth in the digital economy. It led to a sharp spurt in ICT spending from 8.9% of the GDP in 2006 to 12.1% of GDP in 2013[18]. The benefits to the customers are substantial. It has reduced the cost of money transfer from 7 percent in 2003 to 3 percent in 2010 apart from provider like M-Pesa emerging as a partial substitute for the formal banking system[19]. In Tanzania and Kenya, the number of transactions using ATMs has declined.

Investments in Technology: Nature, Impact and Implications

The success of alternative channels, albeit dispersed and in specific (controlled) environments, offer valuable insights. We contend that the nature of technological investments by various governments and institutions means that the hitherto existing ecosystem can become the basis to build a robust system that can provide an alternative to the present cash transactions. In a number of States, the past decade has witnessed substantial investments in information technology to improve efficiencies in delivery of government services or welfare programmes. We proffer that these investments and initiatives can be the foundation for an economy based on electronic transactions. This transformation to an economy dependent on cash has the potential to benefit all the stakeholders.

The case of IIT Bombay students and faculty cashless micropayments using Near Field Communications (NFC) tags is illustrative of the opportunities. In a pilot project ("The Power to Pay") involving Canara Bank, ITZ cash and NPCI, the students use NFC tags pasted at the back of their mobiles or carried in their wallets. The contactless card (tag) operates more like a pre-paid account with a transaction upper limit of Rs.10,000 per month. These tags are be loaded with cash either through merchant outlets or online bank transfers at no extra cash. This reduces the need to carry cash in the pocket and can be used to make small payments like food and refreshments, bookshops, groceries, telephone recharge, stationery and other small purchases. Similar pilots have been tried and are under different stages of implementation in IIM, Bangalore and IIM Calcutta.

[18] "Breaking the Barriers with Technology: A Special Report on the Kenyan ICT Market," IDC Government Insights White Paper with sponsorship from the ICT Authority of Kenya, April 2014", http://www.connected.go.ke/wp-content/uploads/2014/04/ICTA-Whitepaper_Final-100414.pdf

[19]Issac Mbiti and David N Weil, "Mobile Banking: The Impact of M-Peas in Kenya", NBER Working Paper No.17129, June 2011, (http://www.nber.org/papers/w17129.pdf)

A cursory glance at various technology investments over the past decade in states like pre-bifurcation Andhra Pradesh indicates that a large part of the identity of the citizens is already available and accessible in digital form thereby offering a possibility to move towards electronic transactions on a larger scale. During the Aadhaar enrolment process, the Civil Supplies department used it as an opportunity to link the civil supplies database with that of Aadhaar. The undivided state invested large sums on the following databases:

Table 1: Already Mapped: Government Databases in AP (Before Bifurcation)[20]

	Particulars of Database	**Citizens/Households Mapped**	**Date / Status / Nature**
1.	Self Help Groups	1.14 crores Individuals	Constantly Updated
2.	NREGA	1.2 crore job cards	Constantly Updated
3.	Pensions	68 lakhs	Completed, Exhaustive
4.	MFI Borrowers	All the 1.1 crore borrowers	Completed
5.	Community Based Insurance[21]	90 lakhs	Existing, Exhaustive
6.	Student scholarships	Nearly 4 lakhs	April 2012
7.	Health Insurance (Aryogyasri)	52 lakh patients	April 2011
8.	Co-contributory Pension Scheme	48.93 lakhs	April 2012
9.	Disability[22]	9.75 lakhs	9.75 of 13lakh collected.
10	Community Managed Sustainable Agriculture	11.89 lakh small farmers	Exhaustive, GPS
11	Employment Guarantee and Marketing Mission	4 lakhs	March 2012

[20]Compiled from various government department websites and Annual Reports.
[21] Including *Aam Admi Bhima Yojana* and *Janashree Bhima Yojana*
[22] A specialized technology platform has been created by TCS for the Department of Rural Development, called Software for the Assessment of Disability for Access Rehabilitation and Empowerment (SADAREM)

In past year, post-bifurcation, the two States have linked almost all government services to Aadhaar. This offers the government greater administrative flexibility to implement programmes since it offers the opportunity to overcome critical gaps in the existing databases: identity and authentication. In the past, a large part of the population was mapped through various databases (Table 1) and could be tracked only as long as they remained in the place where they registered. Once, a person moved out of the place where they were registered, institutions of the State had no information about them. Aadhaar enables the government to overcome this gap thereby enabling various State Government departments to integrate their databases. These departments include Rural Development, housing, local bodies, revenue and transportation. In most cases, thanks to DBT and Aadhaar rollout. With certain modifications, these databases can be integrated with that of a bank thanks to Aadhaar linkage with bank accounts, especially Jan Dhan accounts. Thus, a large part of the necessary conditions like information about the customer already exists.

A major benefit of this will be the hitherto non-existing ability of the banks to integrate the data available in different locations with different government departments and private agencies. This offers a solution that most financial institutions now face: that of fragmented data. That data when compiled, consolidated and integrated from different sources offers an opportunity to make financial providers more efficient because it can provide large quantity of information but also qualitatively better information of the customers. An example best illustrates this: banks accessing the data from the transport department, land records and health records can help financial providers design more relevant products. Apart from customers, digital transformation will benefit the banking system substantially. McKinsey estimates that it in European context, digital transformation of banks can increase revenues by an estimated 30 percent and reduce costs by 20-25 percent[23].

New initiatives and Implication for Digital Ecosystem

It is in the above context that we have to approach the possible impact of programmes of various central and State government programmes like Jan Dhan, the spread of banking system,

[23]"Olanrewaju, 'Tunde, "The Rise of the Digital Bank" July 2014 (http://www.mckinsey.com/insights/business_technology/the_rise_of_the_digital_bank) Website Last visited 3 June 2015.

"Anywhere Rations" (E-PoS), the increased use of Aadhaar and their implications for the creation of a digital ecosystem. A combination of Jan Dhan, Aadhaar and Mobile (JAM), the spread and increased adoption of mobile internet offers conducive conditions. The Tele-density in India is about 77.27 percent[24]. Rural Tele-density is nearly 50 percent with almost every household possessing a mobile connection. A remarkable feature of the past few years is the increase in the number of mobile internet subscribers, which has increased from about 213 million customers at the end of December 2013 to about 248 million at the end of December 2014 out of the total internet subscribers of about 267 million[25].

The mobile is now the only medium through which a large number of people in rural areas connect to the outside world. Mobile internet is emerging as an important means to connect to the outside for personal and economic needs. Often, the amount spent on data exceeds amount spent on voice calls. Though exhaustive statistics are not available, mobile internet has complex and fascinating uses, especially in the villages and small towns. It includes recharge of mobiles, order for FMCG goods through cash-on-delivery, entertainment, news and occasionally money transfers. Cash-on-delivery models are rapidly transforming the small-town businesses. It is now common for small town business owners to order spare parts on B2B sites using their mobiles. This allows them to cut out the intermediaries, increase their margins while being sure about the authenticity of goods purchased. In short, mobile, mobile internet and the spread of banking outlets in the villages are speeding up the trade cycle thanks to faster payments. In rural areas, there is an increasing propensity to use various digital wallet service providers like PayTM for mobile recharges. Hence, there is an increase in the number of electronic transactions and an increased tendency to access the internet, especially in rural areas. However, a large part of these user groups consists of the youth. Apart from these changes, the use of mobiles to book and pay for taxis, travel bookings, etc is rapidly growing. Invariably, these require payments in electronic forms. A recent newspaper report pointed out that, mobile travel gross bookings tripled between 2012 and 2013, increasing from US$110 million to US$305 million[26].

[24] http://trai.gov.in/WriteReadData/WhatsNew/Documents/PR-34-TSD-Mar-12052015.pdf (Web site Last visited 1 June 2015).
[25] http://www.trai.gov.in/WriteReadData/PIRReport/Documents/Indicator_Reports%20-%20Dec-14=08052015.pdf (Website last visited 1 June 2015).
[26] http://www.business-standard.com/article/management/mobile-persuaders-115060101676_1.html (Website last visited 2 June 2015).

The success of PMJDY offers an excellent opportunity to provide a framework around which a more extensive digital ecosystem can be built. As per government statistics, there are an estimated 15.59 crore Jan Dhan Accounts of which about 13.96 customers have received their Rupay Cards. The total deposits in these accounts is Rs.16,918.91 crores deposits[27]. The reach of Jan Dhan offers an opportunity to make these accounts the basis around which a larger network that links users to small businesses – many which already access the formal banking system. Aadhaar enabled micro-ATMs (at Business Correspondent outlets) offer an opportunity to use Rupay cards validated by biometrics to pay for purchases replacing cash. This requires certain pre-conditions to be fulfilled. Importantly, it will require the banks to create a system that will enable transfer of money almost instantaneously – not a problem if each Rupay Card is provided with an inbuilt IMPS registration and NFC tags. This will enable Jan Dhan holders to start transactions within their network without the need for fresh registration about which there is often no awareness. Such inbuilt IIMPS and when used with contactless cards or any other such facility/devices will enable people to use it to instantaneously pay for their transactions either by using the account number of the mobile or a PoS machine.

Another useful initiative currently under various stages of implementation is "Anywhere Rations". A recently concluded successful pilot project allows citizens to draw their rations from any "Fair Price Shop" of the Civil Supplies department in the city. Since the Civil Supplies Department's database is linked with Aadhaar, the department tracks the movement of rations in real time. The initial pilot project in 20 Fair Price Shops across Krishna district is reported to be a major success and there are plans to expand its scope. It is claimed that e-Pos reduced leakages to just 2 per cent against the national average of 15 per cent[28]. The savings were estimated at Rs.1.91 crores per month in the district[29]. The expansion will be facilitated due to the investment of Rs.192 crores to automate Fair Price Shops with the installation of 28,599 ePos devices-cum-electronic weighing machines and 28599 Iris readers[30]. This will allow the 267 Mandal (Tehsil) level stock points to be monitored from a central location. The useful feature of the State

[27] http://www.pmjdy.gov.in/account-statistics-country.aspx (Website last visited 1 June 2015).
[28] http://timesofindia.indiatimes.com/city/vijayawada/DBS-pays-off-in-Krishna/articleshow/51175767.cms (Website last visited 31 March 2016).
[29] http://www.thehindu.com/news/cities/Vijayawada/district-collector-takes-on-bigger-role/article8380065.ece (website last visited 31 March 2016).
[30] http://dfpd.nic.in/writereaddata/images/minute_to_minute.pdf (Website Last Visisted 31 March 2016)

Aadhaar enrolment drive was that it collected additional information that includes driving license number, SHG number, ration card details and other details. Resultantly, the government possesses a comprehensive database of information about the individual. Through this system, linking the bank account offers an opportunity where cash need not change hands and instead can move directly from the accounts of the beneficiary to that of the Fair Price Shop owner. Thus, combining Aadhaar, Civil Supplies database and banking data will enable the creation of a huge network in a region. Such a linkage can facilitate seamless transactions within the local community. This reduces the need to transact in cash and instead use electronic transfers for transactions. A similar manner for transferring subsidy related to fertilisers and paying the dealers is not difficult to implement.

Digital Eco-system: Challenges and obstacles

The attempt to create a digital ecosystem is not easy and requires a Herculean effort. At the least, it requires a hitherto unheard of effort of various agencies, government departments, banks and private parties working together – possible but, rarely undertaken in a country like India. Practically, it requires a complete change in mindset among all the stakeholders. If history is any guide, different departments and institutions pulling in different directions is not new in India. Importantly, it requires the filling of various infrastructure gaps. We highlight some of these challenges and obstacles that we have come across during our field studies.

An important deficiency is the lack of access points in rural areas. Despite efforts over the past couple of years, there are only about 3.37 banking outlets (branchless mode) in the rural areas and 46,126 banks covering a total of 3.83 lakh villages – or approximately in 50% of the villages. Another 4.90 lakh villages are expected to be covered by March 2016[31]. However, the villages with active customer service points (CSPs) or BCs is much lower than suggested by official figures. Clearly, the spread of the banking system does not have the banking access points or point of sale (PoS) machines to support a large-scale move to electronic transactions, especially in rural areas. This needs to be seen in the context of the large role played by the

[31] https://www.rbi.org.in/Scripts/AnnualReportPublications.aspx?Id=1122

informal sector consisting of nearly 5.84 crore establishments providing employment to 12.77 crore people[32].

One possible manner in which the issue of access can be overcome is to encourage the use of PoS machines by bringing in suitable changes to the Shops and Establishment Act to make it mandatory for businesses to install and use PoS machines on the lines of the use of standardised weights and measures. If these machines are Aadhaar enabled, the machines can be used to undertake various kinds of transactions including banking transactions – even withdrawal of cash rather than only for payments. Enforcement and compliance of this rule may not be as difficult as thought since there is an existing administrative mechanism that supervises Shops and Establishments. Amendment in the above-mentioned act with provisions that make the non-existence or non-usage of these PoS machines punishable can offer better compliance. Successful implementation of this change can improve dramatically if various informal enterprises are encouraged to register with pre-selected vendors that can include government agencies, technology providers, banks and others. Offering incentives like funding for these machines and even subsidising them as part of Jan Dhan can improve faster adoption thereby deepening access.

There is an urgent need to reduce the transaction cost by removing charges levied for credit or debit cards. This is essential to encourage the increased use of the Rupay card or to facilitate other forms of electronic transactions. Alarge part of the daily transactions in rural areas are small transactions. Imposing a transaction charge on these micropayments will be a disincentive for the use of electronic transactions as increases the cost of transactions. Hence, there is a need to revisit these charges, especially in rural areas.

The success of electronic transactions is intricately linked to the need to comfort users that there will be no harassment by regulatory or tax vigilance authorities. Encouraging electronic transactions requires the government to relax this vigilance for a period of time at least to a certain limit (like Rs.50,000) for transaction in small towns and rural areas. Demand for income tax returns and other demands from informal businesses will only scare people leading to large

[32] Provisional Results of the Sixth Economic Census (http://mospi.nic.in/mospi_new/upload/sixth_EC_pressnote_30july14.pdf) website last visited 2 June 2015

sections to continue to transact in cash. The greater the fear of tax vigilance and compliance the more likely that it will serve as an obstacle to the growth of electronic transactions and the ability to gain traction and economies of scale.

Charan Singh, et al (2014) offer comprehensive suggestions based on their study of Tumkur villages of Karnataka to expand financial inclusion that are useful in the context of creating and expanding the reach of the digital ecosystem. These include increasing the access points at prospective transaction points and using the extensive network of Post Offices and Fair Price Shops. Concurrently, clubbing ATM and deposit taking machines into one and expand their scope by introducing features like document scanning, finger print readers/iris detector and camera in a manner that it can offer all the banking services automatically. Such machines using biometric identification of users, voice commands and narration for all facilities will make them user-friendly[33]. They suggest Improving access by leveraging the extensive post-office and

The success of the digital ecosystem is possible only if there is change in the mindset. The rollout of the Business correspondent model attests to these problems. During the initial months after the opening of a BC outlet in a village, a frequent complaint and a reason for its slow adoption by the local community was because people were suspicious that the outlet was not a genuine extension of the bank. An oft-cited reason for this suspicion was that the BC did not issue a passbook that had a written record of the transactions. This changed after many banks started issuing passbooks. Large-scale adoption of the electronic transactions requires a changed mindset which is possible only through a massive awareness programme.

There are other obstacles to the increased adoption of electronic transactions. The fear about security is one such important factor. Certain regulatory norms though useful serve to limit the un-fettered growth of electronic transactions. RBI guidelines require two-factor authentication for further growth of contactless cards based on NFC. Last but not the least, there is always the question of how merchants can accommodate so many different payment providers as there is a proliferation of various mobile operating systems or mobile handset sellers offering payments services.

[33]Charan Singh, et al., (2014), *Financial Inclusion in India: Select Issues*, IIM Bangalore Working Paper 474, Bangalore.(Available http://ssrn.com/abstract=2532876; Accessed on 4 June 2015)

Conclusion

Thus, in conclusion we opine that the creation of a larger digital ecosystem is not as difficult as often perceived. In fact, the potential and its benefits are as overlooked as the benefits of financial inclusion. Investing in the digital ecosystem needs to be approached as an investment in the future need for a growing economy rather than as one borne out of compliance requirement. The expansion of Jan Dhan, investments in Digital India along with investments already made offers a unique opportunity to create an extensive digital ecosystem that can facilitate a transformation from a predominantly cash economy to one that is fuelled by electronic transactions over the next decade or two. However, that requires a serious effort by all the stakeholders.

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