

# **The Transformative Impacts of the Mobile Phone and Electronic Transactions in India : Lessons, Policy Issues and Challenges**

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# Outline

- Overall Trends in Mobile communications
- Digital India – Indicators and Initiatives
- Digital Infrastructure, Electronic Transactions and Payments - the Indian scene
- The Way Forward – Supply and Demand Sides
- Impacts

*“Every day we are moving closer to having almost as many mobile subscriptions as people on earth...**The mobile revolution is m-powering people in developing countries by delivering ICT applications in education, health, government, banking, environment and business.** Let us all celebrate this mobile miracle that I have no doubt will hasten our pace towards sustainable development.”*

- Brahim Sanou, Director, ITU Telecommunications Bureau, “The World in 2013: ICT Facts and Figures”

- In the last 15 years
  - The use of the increasingly intelligent mobile phone has exploded;
  - **It has become the most widely used communications device in the world;**
  - **The device of choice in developing countries;** and
  - **Often the only device for accessing the Internet in countries like India.**

# The Mobile Revolution and Digital Economy

- **The new mobile technology, used in combination with the existing ICT-enabled infrastructure, increases economic efficiency and enables innovation across all sectors of the economy, creating jobs and increasing prosperity**
- Mobile communications requires the use of **Last-Mile wireless networks**, combined with **Middle-Mile and Core wireline networks**
- **From a Public Policy perspective, the most important public sector input for wireless communications is spectrum. Its availability is the lifeblood of high bandwidth wireless, Internet-based services delivered via 3G, 4G/ LTE networks**
- **Digital transactions and payment systems, combined with the ubiquitous use of smartphones, Point-of-Sales (POS) terminals and other access devices, can bring about a transformation in business transactions and social interactions**

# Digital India – a Moonshot project?

- **Digital India focuses on three fundamental areas**
  - Access to digital infrastructure as a utility
  - A variety of services on demand, including online payment systems
  - Digital empowerment of citizens, through access to digital information, electronic transactions and payments
- **Digital India has been called a “Moonshot Project”**, that brings together the best of human and capital resources to achieve a goal previously thought to be impossible: **The transformation of Indian society**
- **Aadhaar**, the world’s largest personal database, with more than 1 billion UIDs and growing, forms an essential component of the Digital India strategy

# Indian Telecommunications Sector

- As of October 31, 2016 (TRAI Report)
  - Telephone subscriber base – 1,102.94m
  - **Mobile subscriber base – 1,078.42m (97.8%)**
  - **Wireless Tele-density = 84.34%**, Overall Tele-density = 86.25%\*
  - **Urban subscribers – 642.37m (58%) / Tele-density = 160.50%**
  - **Rural subscribers – 460.57m (42%) / Tele-density = 52.43%**
  - **Broadband subscribers – 218.42m (74.43% year-over-year growth)**  
**(Wireless – 200.49m, Wireline – 17.93m)**
- As of September 16, 2016 (TRAI Report)
  - **Total Internet subscribers – 367.48m**
  - Wireline Internet subscribers – 21.26m
  - **Mobile Internet subscribers – 346.22m (32.98%)**
  - **Narrowband subscribers – 175.18m**
  - **Broadband subscribers – 192.30m**
  - Urban Internet subscribers per 100 population = 61.98
  - Rural Internet subscribers per 100 population = 13.65

# Digital India – other relevant statistics

- Population of India (est.) – 1,280M (128 cr)\*?
- Rural Population – 880m (88 cr)\*, Urban Population – 400m (40 cr)\*?
- No. of villages – 620,00
- **No. of Gram Panchayats – 250,000**
- **No. of retail merchant establishments (est.) – 15m**
- **No. of Micro, Small & Med. businesses (est.) – 36m**

As of December 31, 2016, it is estimated that:

- **No. of Aadhaar cards issued by the UIDAI – 1+ billion**
- No. of Indians with regular bank accounts – 90m (9 cr)?
- Jan Dhan Yojna & Rural Banks accounts - 290m (260m + 30m)?
- **No. of credit/debit cards issued in India - ?**
- **No. of POS terminals in use – 1.462m (1.14 per 1000 pop.)**
- **No. of Smartphones in use – 350m?**

# Telecom Policies & Broadband Strategies

- **Digital India Initiative – Network Backbone**
  - National Optical Fibre Network (NOFN) and BBNL
  - **Bharatnet**
- **National Telecom Policy 2012 (NTP 2012)**
  - Vision, numerous Objectives and proposed Strategies, but no specific funded initiatives
  - **Provide high speed and high quality broadband access to all village panchayats, through a combination of technologies, by 2014, and progressively to all villages and inhabitants by 2020**
  - Ensure adequate availability of spectrum, and its allocation in a transparent manner through market related processes
  - **Make available additional 300 MHz of spectrum for IMT services by 2017, and another 200 MHz by 2020**

# Backbone/Middle Mile Network: Infrastructure Initiatives by Government

- **National Optical Fibre Network (NOFN)**, the backbone of the Digital India initiative, that functions through a special purpose vehicle Bharat Broadband Network Limited (BBNL), is **now called BharatNet**.

<b>Parameter</b>	<b>NOFN</b>	<b>BharatNet</b>
Estimated Cost	\$ 3,500m	<b>\$ 12,000m</b>
Scheduled Completion Date	December 2016	<b>December 2018</b>
Target Village Administrative Units	250,000	<b>250,000</b>
Current Reach	10% or 25,204	Not Applicable

# Digital India – Towards a Less-cash Economy?

- **India has a cash-driven economy**
  - Estimated that cash is used for payments in more than 80% of transactions by volume
  - Particularly true of transactions between consumers and micro/small businesses
  - Estimated that over 90% of informal economy is based on cash
  - Cash transactions often leave no records or trails, making it impossible to apply value-added taxes like the proposed GST
- **The Digital India Initiative seeks to move the economy to a “Less cash” (rather than Cashless) model, by promoting electronic transactions and payments**
  - **The 80/20 Rule?**
  - **Announced incentives for electronic transactions**
- **A key challenge will be to automate high volume, low value transactions between consumers and micro/small businesses**

# Categories of Electronic Transactions

Participants: Governments (G), Citizens/Consumers (C), Businesses (B) and micro/small-Businesses (mB)

- **G2C\***: Direct Transfers of Benefits & Subsidies to beneficiaries, using Aadhar UID and regular or Jan Dhan bank accounts\*, Tax filings, IRCTC Railway reservation and ticketing system\*
- **G2B**: Tax filings, Set-up and Registration of businesses, Mandatory filings (requires unique Single Business Number)
- **B2B**: Purchases & payments along value chains, and between wholesalers & retailers
- **B2C\***: Purchases of goods and services by customers from service providers, retailers & dealers
- **C2mB\***: High volume/frequency and low value purchases, almost entirely cash based

# Electronic Payment Modes and Systems

- EFTS for high value transactions
  - RTGS & NEFT for bank-to-bank transfers between accounts
- **Credit and debit cards (e.g. Visa, MasterCard)\***
  - **Used with POS terminals – physical transaction**
  - **Also used in payment systems for online transactions**
  - Debit card user must have sufficient funds in bank account to cover each transaction when it is made (important for Jan Dhan accounts)
- **Mobile E-Wallets\* (e.g. PAYTM)**
  - Require Smartphones with appropriate applications software
  - Funds transferred from E-Wallet of buyer to E-Wallet of seller
  - Payer must maintain appropriate balance in wallet – recharging
  - **PAYTM** is the most commonly used E-Wallet system
  - **M-Pesa** and **Airtel Money** (does not require a smartphone)
- **Other Smartphone based Applications**
  - Aadhar enabled payment systems, e.g. **BHIM/AEPS**

# Payment Systems Using Aadhar

- **Bharat Interface for Money (BHIM)**

**Requires smartphone with appropriate applications software, and fingerprint scanner for the user, as the input device**

- UIDAI & TCS developed system, using UPI platform
- Launched fully in January 2017
- Evolution of Thumbprint from “Anguthachaap” to biometric personal identifier, linked to the Aadhaar Number of the user and through it to the bank account

- **Unified Payments Interface (UPI)**

- A platform managed by the National Payments Corporation of India (NPCI)
- Access open only to banks, through their mobile Apps
- Enables bank account holders to send/receive money instantly to & from customers of any other bank (without full account details)

- **Unstructured Supplementary Service Data (USSD)**

- Can use even a basic mobile phone, without an Internet connection, to transfer money up to INR 5,000
- Requires the IFSC Code of the bank holding the account, and the Aadhaar number of the user

# Digital India – Bottlenecks and Challenges

- **Slow/delayed infrastructure deployment, especially Last Mile broadband wireless connectivity (3G/4G/LTE networks)**
  - Spectrum availability in Indian Metro cities is only about 10% of the availability in similar cities in developed countries
  - Huge shortage of Wi-Fi hotspots – need to be increased by almost 2 orders of magnitude
  - **Urban-Rural Digital Divide** - providing mobile connectivity in remote rural areas is not proving to be viable for service providers
  - Need a uniform Right of Way (RoW) policy across all states, with an affordable cost structure
- **For universal accessibility and use, significant efforts are needed to customize applications and services for local needs**
  - Major challenge to find such vendors
  - Need to incentivise new entrants and start-ups?
- **Cyber-fraud, cyber-crime and data security have emerged as a major challenge**

# Security of Electronic Transactions and Payment Systems

- For ubiquitous adoption and use, **trust** in the security of the payment systems and the accuracy of the transactions is a key requirement
- **Need to balance Security with Ease-of-Use**
- **Security is required at several levels:**
  - **At the network infrastructure level** - responsibility of network service provider
  - **At the device level** (smartphone, POS terminal), both for the hardware and operating software
  - **At the Applications level** - responsibility of service provider
  - **At the user level** (protection of PINs, Passwords, etc)
- Accurate Identification, Verification and Authentication of the two parties and the transaction, at an affordable cost, is a key requirement to promote e-commerce and combat cyber-fraud

# Meeting the Challenge: The Role of Governments

- ***“Governments, businesses and civil society should work closely together to ensure that trust, security and privacy are as fully secured on the internet as they are in the real world.”***  
**Amsterdam Declaration, World Congress on Information Technology, Amsterdam, May 25-27, 2010.**
- Historically, governments have played a major role in ensuring the orderly implementation of broad, transformative technologies (e.g. railroads, electricity, the telephone and the automobile)
- **Governments need to help build a Trusted Environment for electronic transactions and Internet commerce**
  - **Both Nationally and Internationally**
  - **To help combat cyber-crimes like identity theft and cyber-fraud**

# Way Forward – Supply Side

- **Spectrum roadmap to 2025, including identification and re-allocation of at least 500 MHz of new Spectrum to be auctioned**
  - **For increasing the capacity and capabilities of Last Mile 3G/4G/LTE networks, to accommodate more users and applications**
- **Develop an affordable, easy-to-use entry level smartphone, to promote ubiquitous adoption and use of Internet-based services in India**
  - Must be capable of running the most used applications, over 3G/4G/LTE mobile broadband networks
  - A price point in the INR 2000-3000 range? (Sundar Pichai, Google)
  - **Could double or triple the number of smartphones in use**
- For the efficient roll out of networks and services, particularly transactional and electronic payment services, need to clearly identify the role of governments and the public and private sectors
- Public-Private Partnership (PPP) models should be explored for sustainable development of digital infrastructure (like Metro rail projects and toll roads)

# Way Forward - Demand Side

- **Need a “Demand Pull” strategy to complement “Supply Push” initiatives**
- **Governments can set an example by becoming Model users** of electronic transactions and accepting/making electronic payments,
  - **For G2C and G2B systems, wherever feasible**
  - Encouraging Public Sector enterprises to do the same
- **“Cashless Village” pilot/demonstration projects in Gujarat and other states**
- **Incentives to greatly increase the number of POS terminals**
  - **Particularly in the retail sector and among micro-businesses which often work on very low margins**
  - **To enable payments via debit and credit cards**
- **Promotion of outreach and educational programs, to increase digital and financial literacy and the ability to use smartphones**
  - **Among the population at large, to change their mindset from cash towards non-cash and electronic transactions**
  - **Especially for rural populations and disadvantaged groups**

# Economic Impacts and Benefits

- The impacts of a transformative technology like mobile phones and a “Moonshot Project” like Digital India are of 2 types:
  - **Direct benefits**, which result from new and more efficient ways of doing existing tasks and processes, and
  - **Indirect benefits**, which result from economic spillovers across many sectors of the economy, and new ways of doing new things
- **Indirect benefits are difficult to quantify, but in the long run are usually more important than direct benefits**
- The benefits of the first generation mobile phones, which are now used ubiquitously for voice communications and texting, have already become evident in new ways of doing business
- **It is premature to talk about measuring the economic and societal impacts of smartphones and electronic transactions**
  - **The direct and indirect benefits will only become visible, quantifiable and measurable in the medium and long term, following universal adoption and ubiquitous use**

Thank you

*Any Questions???*