The Global Standardisation Forum for India (GISFI)

Presentation by: T.R. Dua
Vice Chairman
GISFI
Agenda

- About GISFI
- Mobile Revolution – Global / India
- Evolution of Mobile Banking
- Major challenges for M-payments service
- Current Snapshots
- Technology drivers & Emerging Technology Trends
- Overview – Mobile Payment Services Security
- Mobile Payment in India – SWOT / Regulatory scenario
About GISFI
ABOUT GISFI

GISFI (Global ICT Standardisation Forum for India) is a standardisation body. This is a Non-Profit, Non-Government Society registered under Indian Laws, GISFI provides a platform for operators, academia and ICT professionals to join with Government to identify standardisation needs and develop standards in the ICT sector with focus on India.

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GISFI joins Government’s initiative to harmonise and unify the ICT standardisation efforts within the Indian market and work in close cooperation with all standardisation bodies acting as a catalyst for India’s growth as a knowledge-based economy.
Vision and Objectives

To be an ICT standards forum in India, that develops standards to meet the Indian requirements, as well as contributes towards the evolution of Global Standards

- To unify standardization efforts in India
- To create standards addressing the specificity of the Indian ICT Scenario
- To answer the business needs of the Indian market
- To promote Indian Initiatives Globally
- To strengthen ties with leading institutes
- To develop and cultivate R&D agenda
- To develop skilled manpower & IPRs
Vision and Objectives...Contd.

A Public – Private Partnership effort in ICT standardisation & patent based research for product development in ICT area to address the rural needs and others

- Be the leading ICT SDO in India
- Develop standards to focus on India with Global reach
- Enhance international ICT standardisation efforts.
- Harmonised growth in domestic ICT industries and global competitiveness.
- Prime mover of innovation and enhancement of existing technology.
Members and Collaborators

• Corporate premium
  – NIKSUN
  – NEC
• Corporate
  – Ericsson
  – Motorola
  – Tejas Networks
  – Tata Consultancy Services (TCS)
  – Nokia Siemens Networks (NSN)
  – HUAWEI
• Institutional
  – WIP Labs
  – COAI
  – IIT- Hyderabad
  – IIIT-Allahabad
  – Sinhgad Technical Education Society
  – Vihaan Networks (VNL)
  – Rajiv Gandhi University of Knowledge Technologies

• Support from Department of Telecom & Telecommunication Engineering Centre
• GISFI is officially approved and recognised by DoT, Government of India
• GISFI is an ITU Sector Member
• ETSI
• ARIB
• In talks with IEEE, TIA and the Telecommunication Technology Committee (TTC)-Japan
• Invited as an observer to GSC
GISFI Standardisation Topics Relevant to the Indian Scenario

The following working groups have formed to address:

• Spectrum
• Future Radio Networks
• Internet of Things
• Service Oriented Networks
• Green ICT
• Special Interest Groups:
  – Security and Quality of Service
  – Wireless Robotics
Mobile Revolution – Global / India
The World’s Second Largest Market

- Area – 3,287,263 Square kilometers
- Population >1.21 Billion
- 22 Official Languages
- Literacy Rate (2011 census) – 74.04%
- Average Annual Growth Rate
  - Population – 1.33%
  - Labour Force – 2.2%
  - GDP- 8.5%(2010-2011)
  - Export of Goods & Services – 21.8%
- Trade
  - Total Exports> USD 247 Billion ( in FY 2010)
  - Total Imports > USD 359 Billion ( in FY 2010)

States are co-terminus with telecom circles – 22
The Indian Mobile Magic

“The transformation in telecommunications has accomplished what our socialist policies couldn't — empower the less fortunate”.

...... Shashi Tharoor

Mobile has permeated almost every segment of the everyday life of citizens
The Mobile Revolution

- Over a million new subscribers a day
- Many developed countries over 100% penetration
- Rising fast in developing countries
- 615 million mobile wallets in 2011, growing to 1.4 B by 2015

Source: Wireless Intelligence, EDC GSMA Study
Growth of Mobile Service Subscribers

Current and Projected number of subscribers (In millions)

1. Mobile phone tariffs in India are among the lowest in the world
2. Industry has registered an YOY growth of more than 40% in the last calendar year
3. Tele-density has increased 66.16 as on 31st Dec 2010 with urban tele-density at 147.88 and rural tele-density at 31.18.
4. Approx 64 million telephone subscribers added in the last quarter of 2010.
5. 3G is the new mantra of growth
India has the highest MOUs

PAY LESS....TALK MORE

India’s business case based on volumes & not margins
India has the highest MOUs

India ARPU at U$D 4.26

Source: BofA Merrill Lynch Global Research estimates
Indian Cellular Industry - Snapshot

- 220 operational networks
- ~ 806 Mn mobile subscribers as on June 2011
- Rs. 150,000 crores Investments / USD 34 billion
- Lowest Tariffs in the World
  - Leading to lowest ARPU’s i.e. subscriber bills!
- High minutes of use (MoU)!
- Telecom sector is also driving growth in Manufacturing and R&D.
- For every 10% increase in mobile penetration rate there is a 1.2% higher growth rate

“The best is yet to be!!!”
• “The mobile phone has moved beyond being a mere device to become a key “social object” present in every aspect of our daily lives”

International Telecommunications Union. ITU

• It is well established from various international studies that there exists a causative relationship between increase in telecommunication penetration and GDP growth.

• Mobile infrastructure has demonstrated itself to be the most conducive medium to rapidly deliver the benefits of connectivity in developing economies.

• ICT is an increasingly powerful tool for participating in global markets; promoting political accountability; improving the delivery of basic services; and enhancing local development opportunities

United Nations Development Programme (UNDP)
Evolution of Mobile Banking
Evolution of Mobile Banking

- Familiarization: 2007
  - Balance Inquiries
  - Location Finder

- Convergence: 2009
  - Funds Transfer
  - Bill Pay
  - View Images
  - Actionable Alerts

- Differentiation: 2011
  - Remote Capture
  - Stop Payment
  - Commercial Cash Mgmt.
  - Personal Security
  - Check Reorder
  - New Account Opening
  - M-Statements
  - Mobile POS Payments

- 2012
Mobile Banking Universe - Emerging Markets

- **Stored Value Account (SVA) to Unbanked**
- **SVA to Banked Customers**
- **Mobilized Bank Account (MBA) Customers**

**Telco / Mobile Universe**

- MBS based on a Stored Value Account
- MBS based on Bank Account

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Some Key Statistics

Global

2.7 billion (72%) adults in developing countries do not use formal financial services
[CGAP, Financial Access, 2009]

Over a Billion people globally do not have access to banking services but own a mobile phone
[CGAP & GSMC, 2009]

India

73% of farmer households have no access to formal sources of credit

Of the total farmer households, only 27% access formal sources of credit; one third of this group also borrow from non-formal sources

28 Million no frill accounts opened, but less than 12% active

84 thousand bank branches against 6 lac villages
Economic Drivers

Revenue Model
- Fixed transaction fees Vs percentage of transaction value
- Willingness of end consumers given other channels

Customer Retention & Acquisition
- Payment interactions increase customer intimacy
- This results in lower churn and higher customer profitability

Cost Elimination & mitigation
- Various elements of cost while average transaction value is very low
- Innovative solutions required to reduce cost

Measuring ROI
- The success of the model depends on the ROI generated
- Scale is an important factor for a better ROI
Major drivers for mobile payments in India

- **Mobile penetration**
  - Is at ten times of the PC penetration and is expected to become 1 billion by 2014 in India.

- **Ubiquity and immediacy**
  - It means that the user can avail of services and carry out transactions largely independent of his current geographic location.
  - It provides real-time availability of services.

- **Localization**
  - Location based services such as GPS, allow companies to offer goods and services to the user specific to his current location.

- **Instant connectivity**
  - This feature brings convenience to the user, due to introduction of services like GPRS which keeps users always in touch and connected.

- **Policy mandates**
  - RBI has mandated banks to chart out a road map on financial inclusion by March 2010.
  - RBI to allow companies, individuals, NGOs, cooperative societies and post offices to work as business correspondents for banks.

- **Financial pressures**
  - Telecom companies struggling to incentivize distributors and prevent churn with the entry of new players.
  - M-Commerce can drastically increase volumes, improve stickiness by providing additional revenue stream and gain customer loyalty.
  - M-commerce can reduce the transaction cost to the bank and overall Operating costs.
Major Stakeholders in Indian M-commerce ecosystem

• Banks
• Telcos
• NBFCs
• NGO MFIs
• The Post – The Indian Post
• Solution providers
• National Payments Corporation of India – www.npci.org.in/
• Mobile Payment Forum of India – www.mpfi.org.in/
• Regulatory
  • TRAI - www.trai.gov.in/
  • RBI – www.rbi.org.in/
How are stakeholders placed

- **Telecom Operator**
  - Increase Revenue
  - Reduce churn

- **SIM/Handset manufacturers**
  - Increase Revenue

- **Banks and FIs**
  - Decrease cost
  - Increase Revenue

- **Software providers**
  - Increase Revenue

- **Business Correspondents**
  - Financial Inclusion
  - Socio Economic development
  - Increase Revenue

- **Rural/semi urban customer**
  - Increase Revenue

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Mobile Payment – Market Drivers

Drivers
- Higher Penetration
- Loyalty to Service Provider
- Alternative to Cash
- Government Support

Constraints
- Lack of clear business model
- Lack of Technology Standards
- Security
- Who owns the customer
- Transaction Cost

Mobile Payment Market
Successful launch of M-payment services – Success Factors

**Policy Mandates**
- RBI mandated banks to chart out a road map on financial inclusion by March 2010
- Citizens can soon open a ‘mobile-linked-no-frills account’ for financial transactions.
- Inter-Ministerial Group recommended that “for profit” corporate entities should be allowed to become business correspondents of banks

**Societal demands**
- The number of migrant workers moving from interiors of India to main cities increasing rapidly
- Internal remittances form a significant part of household budgets (medical, education, etc)
- M-Finance is a cost effective, secure and fast alternative to informal mechanisms of money transfer

**Financial Pressures**
- Telecom companies struggling to incentivize distributors and prevent churn with the entry of new players
- M-Finance can drastically increase volumes, improve stickiness by providing additional revenue stream and gain customer loyalty
M-Payment growth over the next few years in India

- Gross transaction value of mobile payments in India to rise to $7.66 billion in 2014
- SMS contribution - 58.7% in 2014
- NFC contribution – 32.8% by 2014
- WAP / Browser-based payments & USSD - limited use in the next 5 yrs
- Merchandise Purchases -$224.4 billion in 2014
Major challenges for M-payments service
Major challenges for M-payments

- **Security**: More is expected in the field of security, like smart cards and robust standards RBI has spoken for two-factor authorization (MPIN and Mobile number)
- **Bandwidth**: As bandwidth demand increases, service providers may have to face problem of bandwidth scarcity
- **Business**: Companies need to integrate capabilities in both telecommunications and information systems
- **Interoperability**: Number of Mobile platforms (Android, Blackberry, Symbian etc)
- The solution should be based on the industry standards in Telecom and banking Industry
- For Telcos to ensure the **prioritization** of the mobile-payments messages and transactions
- **Speed** and minimizing transaction delays is of utmost importance to increase adoptability
- **Acquiring the right skill**: M-commerce lies at the intersection of Mobile Telephony and Banking
Challenges Ahead

- Data Security and Integrity
- Regulatory and Compliance Issues
- Risk Management
- Infrastructure Management

- Fraud Management
- Technology Innovation
- Dependency on tools/card
- Technology Interoperability
Challenges in Mobile Payment Services

Challenges

- Microfinance vs. Higher payment transfers
- Rural /Remote Users Education
- Mobile Payment Transfer Policy Standardization
- Mobile Payment Service Providers and Bank infra- components dependencies
- Mobile Payment Apps & Mobile Devices compatibility
  - Mobile Payment Services Security
    - Payment Gateways Security
    - Payment Apps Security
    - Mobile Device Security
  - Government Policies for Mobile Payments
Current Snapshots
Mobile payments in India: Current Snapshot

Indian Mobile Landscape

- 635.51 million subscribers with addition of 15-17 million per month
- Rural wireless subscribers increased 71% in (2009-10), and urban subscriber base grew by 40.5%
- Wireless subscriber base expected to reach 1.1 billion by 2015 Wireless Tele-density stands at 53.8.
- Rural tele-density grew by 69.2%
- Every 10% increase in mobile penetration produces 0.8% economic growth

Indian Rural Banking Landscape

- 5% of the 600,000 village habitations have a commercial bank branch
- 40% Indians have bank A/c
- 13% Indians have debit cards and 2% have a credit cards
- 51.4% of nearly 89.3 million farm households do not have access to any credit either from institutional or non-institutional sources.
- Only 13% of farm households avail bank loans

Current Scenario

- 32 banks have been given approval to provide mobile banking facility in India; of this only 21 have started providing these services
- Only one MSP has applied for approval to provide such services
Mobile and Mobile Payments are everywhere!

Ahmedabad, India: Tea shopper is taking orders on his mobile phone

South Africa: Farmers are using mobile Money widely to transfer funds.
What will the Future Look

1. Mobile Payments have to be independent of handsets and service providers – need to service a wide spectrum of Customers

2. Collaboration & convergence between Internet, Mobile Technology, Regular Banking, new business models being proposed like Google Wallet required

3. Service Providers have to work with multiple stakeholders

4. Innovation in products and Services supported by innovations in technology will drive this

5. Acceptance will increase as more and more services are built on mobile platform
Industry Trends & Market Opportunities

Mobile banking product innovation is occurring across many of our market areas. The combined market for all mobile payments is expected to reach more than $600 billion globally by 2013 representing a significant new revenue stream for the financial services industry.

Mobile Banking: Transactional Users by 2011
Regional Forecast (%)

Total Global Mobile Payments Market
Gross Transaction Value, US Billions

By 2011, forecasts suggest there will be over 150M mobile banking subscribers worldwide.

>58% projected growth in 6 years

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Models for mobile payment introduction by Banks

**Developed Country Model**
- Alert and Push Services
- Balance Enquiry
- Full M-Banking
- Mobile Payments

**Emerging Market Model**
- M-transfers using minutes
- M-transfers using local currency
- International Transfers
- Account Facilities

**India Model**
Mobile Banking – Changing applications with increasing usage

Virtual bank card
- Mobile devices can replicate bank card, virtually, by identifying the user, the account and the institution where the financial balances are held, thereby removing costs and complex logistics associated with the issuing of physical cards to a distributed population.

Point of Sale terminal
- Mobile devices can be used to initiate transaction requests and communicate with a financial institution to obtain payment authorization, thus mirroring the functionality of a POS terminal.

Internet banking terminal
- Mobile devices with browser capabilities can act as a substitute to traditional methods for accessing the Internet, which is significant in developing countries where penetration is low.

- In emerging markets such as Africa, India and China, the ratio of mobile devices to online users is far greater.
- Leading financial institutions in the Asia-Pacific region have built a solid revenue model for mobile banking by charging customers for mobile banking services.

As of 2009, over 50% European and nearly 35% North American financial institutions were providing mobile based services to their customers.

Source: Datamonitor
Technology Drivers
&
Emerging Technology Trends
Pervasive and Affordable Technology – it is here to stay and will evolve rapidly

- Mobile devices
- Digital photography
- Image recognition
- Security and identity validation technologies
- POS infrastructure
- Downloadable applications
- Portable business analytics
- NFC stickers
- NFC-enabled devices
- Mobile wallets
- Contactless cards
- SMS
- WAP
- HTTP / GPRS
- 3G / 4G
- Mobile Tele-presence
- Location-aware technologies

6 billion global mobile connections are expected by 2013
Mobile Payment Application Architecture

1. Install XYZ Telecom's Money Application (J2ME Application)

Transaction Requests

2. Payment Service Providers – Mobile Validation Layer

Request/Response processing towards Bank's Interfaces / Payment Gateways

Request/Response Validation

Request/Response Authentication

3. Bank Interfaces / Payment Gateways

4. Response Messages Generation

5. Transaction Responses

Success – Response Message

Failure - Response Message

Protocol Errors / Communication Errors

User - Authentication and Validation

Request Message Processing

Request Message Validation
Technology Drivers

Developments along all 3 stages within the payment space will herald a financial inclusion revolution in India

End Point Disbursement

- End point cash out through cheap bio metric devices
- Deployment through BC agents

Transaction Medium

- Mobile as the medium to initiate any banking transaction
- Simpler technology – USSD / SMS based

Customer

- UID to become key customer identification method
- UID & Mobile no combination as an authentication tool
Emerging Technology Trends

Commercial bank models are not effective in rural low ticket business

- **Save Money**
- **Move Money**
- **Hide Money**

- **Keeping it Simple**

- **India Mobile Money Services (MMS)**

- **Mobile Wallets** – Nokia Money
- **P2P Transfers through Mobile** – India Post Money Orders
- **USSD / SMS based mobile solutions** – Beam, MOPAY
- **Mobile Phone/ Mobile number agnostic solution** – IMPS
- **Appropriate technology platform**
- **Omnipresent network of transaction points**
- **Break sub scale trap**
Emerging Technology Trends

**SHG’s/ MFI’s**
- Technology as an enabler for smarter business management
  - Mobile based accounting system by Ekgaon
  - MFI banking solution by YSE

**Unified Approach**
- Various stake holders joining hands
  - JV between Airtel and SBI
  - Mycash – Idea & Airtel

**Mobile - The Next Payment Ecosystem**
- Why cash in or cash out –
  
  *The Mobile Payment Economy*
Building blocks of a Mobile Payment System

- Mobile Payment Platform
- Use Cases & Acceptance Network
- Issuer of MBS & Custodian of Funds
- Distribution Network & Technology Provider

Combined efforts of all partners
Aadhar Database
Mobile Banking Platform Cloud
Interoperable Central Payment Sw

User
Agent
User
Agent

Account Mapper
Aadhar Database

Bank 1
NPCI
Bank 2
Overview – Mobile Payment Services Security
Mobile Payment/ Mobile Banking Security: Attack Vectors

- Transactions Request/Response Attacks
- Payment Gateways Authentication Attacks
- Mobile Validation Layer Attacks
- Verify strong Cryptographic Implementation
- Fraudulent Transactions through Local/Server Data storage
- Improper Session Management
- Authentication Attacks
- Improper Data Validation
- Communication Services Attacks – Channel Gateways, Server Components
Approach – Mobile Payment Services Security

Step I: Scope Definition
- Define Scope and Definition of Proposed Work

Step II: Info Gathering
- Info Gathering (Apps, Source Code, Banking Payment Gateways .. )

Step III: Threat Modeling
- Prepare and execute Threat Test Cases

Step IV: Mobile Payment Apps Security Assessment
- Mobile Apps (Apps, Channels, Req/Response, Crypto Attacks)

Step V: Payment Services Compo. Assessment
- Gateways, Service providers compo., Bank Server
- Mobile Validation Layer Security

Step VI: Reporting
- Report Preparation
- Final Report Submission

Step VII: Mitigation (Reported Risks)
- Remediation Recommendations
- Mitigating Risks with advisory Services
- Secure Interface Development

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M-payments security risks

This is a broad snapshot of the security risks that should be evaluated on an M-commerce platform.
Overview - Mobile Payment Services Security

Major Threats/Issues

- Fraudulent Transactions
- Weak Cryptography
- Mobile Payment Gateways Issues
- Mobile Payment Application’s Database threats
- SIM Card Application (USSD /DSTK ) Attacks
- App Store Security Issues
- Mobile Payment Services Components Security
- Mobile Payment Applications ( IP Based) threats

Business Impact

- Fraudulent Transactions (Revenue Loss)
- Confidentiality (Users Sensitive Data – Credit/Debit Card Data, PIN, User Credentials)
- Communications Services Misuse
- SIM Card & Applications Misuse

Components to be secure

- Mobile OS’s, Mobile Applications, App Store
- Mobile runtime environments
- Mobile SIM Card Applications
- Mobile Communication Servers, browsers
- Mobile Device ......

Mobile Payment Services / Mobile Banking Security

- Mobile Payment Application Security Testing
- Mobile Payment Gateways Security Testing
- Mobile Payment Services Components Security Testing

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Key factors influencing the m-payment security in India

- Third party application providers are bringing cost effective encryption software to encrypt data both when transmitted into network and stored in the device memory.
- High end devices are coming with biometric sensors which help to implement strong authentication in the m-payment system.
- Growing number of mobile anti virus software will ensure the protection of m-payment system from malware/spyware/trojan attacks.
- RBI has issued the strict security guidelines for the m-payment system like minimum 4 digit customer PIN and end to end encryption of the PIN.
- Advanced mobile OS like windows mobile, ios are coming with strong cryptographic API.
- Encryption logic used for 3G, A 5/3 is much more stronger compared to A 5/1 and A 5/2 encryption logic used in 2G and 3G is now being implemented across India.
- Both application providers and telcos are increasing their budget for security assessment of the m-payment system and also spending more for m-payment user training purpose..
Vulnerabilities and attacks affecting m-payment system

Security issues of mobile devices
- Malicious thin client application can initiate transaction by sending SMS without user’s authorization.
- Unauthorized access of sensitive payment and authentication related data stored in the device.
- Weak cryptographic API and predictable keys help to break data encryption.
- SIM card cloning
- Vulnerabilities in mobile OS

Security issues of network
- A5/1 and A5/2 GSM encryption logic do not provide adequate level of security.
- Man-in-the-middle attack can be launched whereby an attacker impersonates a base station to the user and can get the secured PIN.
- The EO encryption scheme employed by Bluetooth could be cracked.
- WLAN operating in the unlicensed 2.4 GHz and 5 GHz band does not provide any security

Service level security issues
- SMS and USSD do not possess any security properties and relies on the GSM/UMTS security mechanism.
- SIM Application Toolkit (SAT) is a technology that allows configuration and programming of the SIM card. Weak encryption logic in SIM application also impacts the m-payment system security.

Security issues due to mobile malware and spyware
- Spyware to track all the transactions carried out by a user.
- Spyware to steal sensitive data from the user’s phone.
- Malware/Trojan to tampers/steal/send SMS messages
- Spyware to crack the user’s PIN
- KeyLogger software on a mobile device captures all the data keyed-in by the user. Which helps attacker to launch an attack using cryptanalysis.
## Ideal characteristics of secured m-payment system

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<thead>
<tr>
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<tbody>
<tr>
<td><strong>Confidentiality</strong></td>
<td>The confidential information must be secured from an unauthorized person, process or device.</td>
</tr>
<tr>
<td><strong>Authentication</strong></td>
<td>Ensures parties with access to a transaction are not impostors and are trusted.</td>
</tr>
<tr>
<td><strong>Integrity</strong></td>
<td>The information and systems have not been altered or corrupted by outside parties.</td>
</tr>
<tr>
<td><strong>Authorization</strong></td>
<td>Verify that the user is allowed to make the requested transaction.</td>
</tr>
<tr>
<td><strong>Availability</strong></td>
<td>The system must be accessible for authorized users at any time.</td>
</tr>
<tr>
<td><strong>Non-repudiation</strong></td>
<td>Ensures that the user must not deny that he/she has performed a transaction and must provide proof if such a situation occurs</td>
</tr>
</tbody>
</table>
M-payment security measures

- **Encryption**: Implement strong encryption when data is transmitted from device to network and also when stored in device memory to ensure data confidentiality.

- **Digital Signature**: To ensure integrity and non-repudiation.

- **Digital certificate**: To enforce authorization.

- **Biometric Signature & Strong PIN**: For user authentication.

- **Mobile antivirus**: To protect the m-payment software from the attacks of malware, spyware and trojan.

- **Mobile device OS & Network Standard**: Implement and follow strictly security standard for both mobile OS and network so that attacks can be minimized.

- **Increase Security Budget**: To implement all the security features in an entire m-payment ecosystem.

- **User Security Education**: The attacker relies on the user to make the wrong choice. Choose not to be a victim.
Case Study – Mobile Payment Application Security for a World’s leading Mobile Supplier

Client Profile

- Client is a World’s leading Mobile Supplier Company
- Client’s core application collaborated with leading payment service providers & largest bank’s payment service components
- Client’s Mobile Payment Application supports for major Mobile OS platforms
- Clients Mobile Payment Application supports India’s largest banks interfaces for Mobile Payments

Security Requirements

- Security threats analysis to Mobile Payments Application, Mobile Validation Layers and Service providers Interfaces.
- Identify the vulnerabilities in their mobile payment client application, mobile validation layer and Payment Service Providers Interfaces communication to the applicable financial transactions and Mobile utilities
- Security best practices / recommendations for identified vulnerabilities.

Offerings

- Black, Gray and White Box Security Assessment for Mobile Client Application, Mobile Validation Layer components.
- IP based and SMS based channels Security Assessment for Mobile Client Application
- Security Assessment for critical Financial modules dependent on external banking gateways interfaces

Value Proposition

- Detailed and proactive Security assessment helped client to ensure secure financial transactions intended through mobile payment client applications.
- Mobile Client Application and Mobile Validation Layers security enhanced through proactive approach during entire SDLC.
Mobile Payments in India – SWOT / Regulatory Scenario
## Mobile payments in India: SWOT

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
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<tr>
<td>• Mobile penetration is more than 4 to 5 times than a PC and is growing at a very fast rate. 15 million mobile subscribers are added every month</td>
<td>• End to end security framework is not yet in place</td>
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<tr>
<td>• Growing acceptance</td>
<td>• Language and literacy levels</td>
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<td>• Greater reach</td>
<td>• Interoperability between Telcos, Banks and third-party developers</td>
</tr>
<tr>
<td>• Convenience</td>
<td>• Low penetration of credit cards</td>
</tr>
<tr>
<td>• Reduction in cost of a transaction done through mobile makes the Financial Inclusion a profitable prospect</td>
<td>• Regulatory impediments</td>
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<th>Opportunities</th>
<th>Threats</th>
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<td>• The m-commerce market is projected to be about Rs 940 bn in FY 2011. Ten percent of $230 bn global international remittance is in India and 70% of this is from the rural segment.</td>
<td>• Lack of clarity with the regulatory authorities like TRAI and RBI</td>
</tr>
<tr>
<td>• Approximately 70% of the Indian population is rural, and less than half actually have bank accounts and access to financial services today.</td>
<td>• Presently, there are no authentication standards set out for operators and aggregators This needs to be addressed by the institution of standards by an industry governing body such as TRAI to authenticate the flow of information. This will help create trust among different stakeholders across the M-commerce value chain.</td>
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<tr>
<td>• RBI mandate for Financial Inclusion to the banks</td>
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<td>• With 3G, the data speeds will increase and can give a push and acceptability to the</td>
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<td>• Inter bank transfer is also on the anvil</td>
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What will make mobile payment business case?

- Leverage current device technology and payment methods such as Faster Payments, contactless cards, direct debits credit transfers
- Support/extend existing security environments
- Support a industry-wide collaborative approach
- Enable commercial differentiation and innovation
- Align with RBI and IBA guidelines
- Encourage the use of current accounts and promote financial inclusion

- Utilizing existing assets
- Provide openness
- Incentivize the stakeholders
- Ease of use
- Security
- Reduce time to market

- Create positive network effects
- Align fees with cost and/or risk
- Ensure that end users trust the brands, frameworks and services
- Use appropriate authentication
- Simple/cheaper to use than nearest comparable alternative
- Enable clear customer support model
- Offer payment immediacy (if not settlement)
- Support a rapid/phased roll-out
- Deliver ubiquity and interoperability between platforms and devices
- Enable a balance of competition between service providers and co-operation around standards

The business model is more than just getting the revenue model correct
How can m-payments help your business?

<table>
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<tr>
<th>Benefit</th>
<th>Details</th>
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</table>
| **Reduce OpEx** | • Extend reach to rural and new areas while keeping operational expenses low  
| | • Cut the per transaction cost of dealing in small amounts. Very useful for MFIs (Micro Financial Institutions) and SHGs (Self Help Groups) |
| **Reduce CapEx** | • can lead to avoidance of investment in setting up local banking nodes by banks in remote rural areas. |
| **Improved product mix** | • Create financial products that better fit with the needs of poor customers such as paying for education, medical expenses, etc  
| | • Create more flexible products to finance small businesses thus improving the entrepreneurial capacity in the country. |
| **Cost advantage** | • Can lead to significant cost advantage in distribution of banking services. Per transaction cost is the lowest in mobile payments when compared with Internet, ATM and branch banking |

Who can benefit?

- **Banks, MFIs**
- **FMCG companies**
- **FMCG & Utilities companies**
Internet Vs Mobile as a Financial Channel

<table>
<thead>
<tr>
<th></th>
<th><strong>INTERNET</strong></th>
<th><strong>MOBILE</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>PENETRATION</td>
<td>1.8 Billion</td>
<td>4.6 Billion</td>
</tr>
<tr>
<td>PURPOSE</td>
<td>Regular</td>
<td>Urgent</td>
</tr>
<tr>
<td></td>
<td>Transactions</td>
<td>Transactions</td>
</tr>
<tr>
<td>DEMOGRAPHY</td>
<td>General</td>
<td>Younger Generation</td>
</tr>
<tr>
<td>LAST MILE CONNECTIVITY</td>
<td>Restricted to Metros</td>
<td>Ubiquitous</td>
</tr>
<tr>
<td>SECURITY PERCEPTION</td>
<td>Comfortable</td>
<td>Uncomfortable</td>
</tr>
</tbody>
</table>

**Reasons for Success of the Mobile Revolution**

- Inexpensive
- Emulation of Online Experience – Internet on Mobile
- Broad Customer Reach
- Changing Demographics - Appeal with younger generation
- Promoted by Government / Regulators for increasing Financial Inclusion

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Mobile Banking caters to variety of Market Needs

- **BANKED**
  - Full Access to Fin. Products
  - Medium - Very High value txns.
  - Fully diversified spend patterns

- **UNDER-BANKED**
  - Limited Access to Fin. Products
  - Medium - High value txns.
  - Moderately diversified spend patterns

- **UN-BANKED**
  - No Access to Fin. Products
  - Low value txns.
  - Restricted spend patterns

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**EMERGING MARKETS**

**DEVELOPED MARKETS**

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## Possibilities With Mobile Banking

<table>
<thead>
<tr>
<th>Possibility</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Money Transfer</td>
<td>Pay Insurance Premium</td>
</tr>
<tr>
<td>PrePaid Mobile Top up</td>
<td>NREGA, Social service pension disbursement</td>
</tr>
<tr>
<td>Pay Utility Bills</td>
<td>Micro / Loan payments</td>
</tr>
<tr>
<td>Pay Merchants</td>
<td>Buy Tickets – Rail, air, Bus</td>
</tr>
<tr>
<td>Pay Online merchants</td>
<td>Line Busters</td>
</tr>
</tbody>
</table>
Consumer Value Proposition

**Convenient:**
No need to go to physical locations for sending money or paying for bills. Saves time.

**Secure:**
No need to store nor carry cash, reducing the risk of theft/loss.

**Simple/intuitive:**
As simple as making a call or sending a SMS with your mobile.

**Money management:**
Keep track of your account balance, expenses and payments.

**Immediate:**
Instant money transfer when needed.
Indian Regulatory Environment

Mobile Banking Transaction Guidelines

- Initially, only Banks with Core Banking Systems can provide Mobile Banking services
- Daily transaction limit of INR 50,000 for P2P and P2B transfers
- Per transaction limit of INR 5,000 (and monthly cap of INR 25,000 per customer) for remittance of funds for disbursement of cash through ATMs or BCs
- Compulsory two-factor authentication, one of the factors need to be mPIN or any higher standard; transactions up to Rs. 1,000 can be facilitated by banks without end-to-end encryption
- Interoperability must between banks and all mobile banking service operators; hence message formats like ISO 8583 mandated
- Bilateral or multi-lateral agreements between banks for clearing and settlement
- Long term goal of mobile banking is to ensure 24*7 clearing and settlement through nationwide infrastructure, enabling real-time fund transfer between two accounts held in any bank and operated by users using mobile banking services of any operator

Prepaid Instrument Guidelines

- Three broad categories – closed, semi-closed and open system payment instruments
- Only banks allowed to offer mobile banking services are eligible to offer mobile based pre-paid payment instruments (mobile wallets & mobile accounts)
- Non-banks allowed to offer only semi-closed prepaid instruments
- Non-banks not allowed to offer Person-to-Person transfer of value
- Maximum value not to exceed INR 50,000, validity period can be a maximum of 6 months
- Semi-closed prepaid instruments for utility payments can be offered without KYC up to a limit of INR 10,000
- Reload of such payment instruments allowed against payment by cash/debit to bank account/credit card either by bank or by agent appointed by bank/non-bank

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Conclusion

The stark reality is that most poor people in the world still lack access to sustainable financial services, whether it is savings, credit or insurance. The great challenge before us is to address the constraints that exclude people from full participation in the financial sector. Together, we can and must build inclusive financial sectors that help people improve their lives.

Former UN Secretary-General Kofi Annan
Thank You

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