Computing and Financial Services for the Poor: The UW Digital Financial Services Research Group

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Pathway out of poverty

• How can the lives of the billions of people who live on a few dollars a day be improved

• Multiple factors
  – Health, governance, education, poverty, food security, environment, infrastructure, civil strife
Improved financial services help

• Strong evidence that improving access to financial services can help people stay out of poverty
  – Poor pay more for services
  – Create new livelihood opportunities
  – Allow more efficient delivery of other services
  – Savings provide a buffer against financial shocks
Technology opportunities for Digital Financial Services

• Near universal access to mobile phones provide an interface with a financial system
• Mobile carriers, in partnership with agent networks and possibly financial institutions can lower the cost of financial services
• Address central financial needs
Financial services for the poor

• Expand accesses to financial services
Basic Financial Services

• Mobile Money
  – Send money to remote location
  – No bank accounts, but mobile phones
  – Rely on basic mobile phones
Background: mPesa in Kenya

• Considered most successful mobile money product
• Implemented by Safaricom (Kenya’s dominant mobile carrier)
• Large CICO (cash in, cash out) agent network
• Works on basic mobile phone through USSD/Sim App
• Send money to a mobile number – various messages and pins to withdraw money from an agent and issue a receipt
However . . . the challenges

• Inconsistent uptake of services
  – No other country has matched Kenya in adoption of mobile money

• Obstacles at consumer level
  – Usability, trust, understanding of services

• Obstacles at implementation level
  – Security, detecting fraud, know your customer, infrastructure failure, managing agents

• Obstacles at system level
  – Multiple carriers, regulatory regime
Improved access to financial services is recognized as an important mechanism for raising people out of poverty

- Financial Services for the Poor
  - Remittances
  - Savings accounts
  - Government payments
  - Digital payments
  - Insurance
Our hypothesis

• Computer scientists, in partnership with others, can address some of these challenges
• Many organizations have been working in mobile money and publishing studies
  — GSMA, CGAP
• Economists and political scientists are studying impact
• Work needs to tie into Mobile Operators and Financial Institutions
The research project

• UW Faculty
  – Richard Anderson
  – Kurtis Heimerl
  – Josh Blumenstock
  – Franzi Roesner
  – Yoshi Kohno

• Project launched January, 2016
DFS Challenges

1. Fraud
2. Cyberattacks
3. Proximity payments user experience
4. Identity and on-boarding
5. Analytics for product development, risk scoring, and fraud detection
6. Cash-in/Cash-out (CICO) agent recruitment, training, and management
7. Financial management for end users
8. Reach and robustness of infrastructure
Research approach

• Judicious landscaping to identify research areas
• Launch a set of small projects
  – USSD
  – Security
  – Computer Science / DFS survey
• Identify area for larger scale implementation
  – Prototype toolkit
  – Work with Financial partners for in country evaluation
  – Refine and handoff to partners
• Establish partnerships for field based work
• Develop DFS Technology demonstration lab
Basic assumption and focus

• Must focus on reach of financial services to the poor

• CICO (cash in, cash out) network is a key component

• Technologies
  – Must allow basic phone for clients
  – Can assume better technology for agents (e.g., Android phone)
  – Robust to infrastructure failure
Research challenges / Security

• Security of mobile money
  – Basic protocols including receipts
  – GSM level security
    • USSD or SIM Apps
  – Android app security
  – Usability and resilience to poor infrastructure are key

• Fraud
  – Risks of fraud across the entire process
    • Many potential bad actors
  – Restrict attention to issues directly related to digital financial services and specific products
  – Lack of data on occurrences of fraud
Research challenges / Usability

• Client side
  – Simplification of process
    • Complexity arises due to security and weak infrastructure
  – Increasing transparency
  – Lack of trust is a deterrence to adoption
    • E.g., worries about sending money to wrong number
  – Need data on problems that occur in practice on specific systems

• Proximity payments
  – Point of sale device
  – Identity (know your customer)
  – Simplified biometrics
Research Challenges/Use of data

• Credit scoring
  – Use of data on phone usage to determine likelihood of default

• Fraud detection
  – Transaction records to detect potentially fraudulent use
  – Analysis to identify patterns of fraud (existence of fraud)

• Call records data to understand potential services

• Initial work
  – Landscape data sources and match to application areas
Research Challenges/Consumer education

• Promotion of good financial practices
• Understanding of basic financial instruments
• How to use of financial services
• Promotion of financial services

• Application of ICT/Behavior change
  – Messaging
  – Community Led Video Education
Research Challenge / Integration

• Integration of mobile money into broader services
  – Payment for services (e.g., school fees)
  – Consumer subsidies

• Community networks
  – Local cellular
For more information

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