What is Mobile Money?

- Financial accounts associated with mobile phone
- Over the counter (OTC) agents are available for Cash In, Cash Out
- Examples: M-Pesa, Tigo Pesa, Easypaisa
Mobile Money Interfaces

- Agent
- USSD
- Smartphone App (Android, iOS)
- SIMApp (via ThinSIM)
What is UW-Pesa?

• Demo platform for mobile money technologies
• Sandbox for experimentation
• Not targeting high performance, scalability, strong security
What does UW-Pesa do exactly?

• Supports basic ledger services
  • Creating accounts, account management
  • Peer to peer transactions
  • Cash in/Cash out
• Can support various interfaces
  • Web portal
  • USSD
  • Smartphone App
  • SIMApp (via ThinSIM)
UW-Pesa Web Portal

Agent

User
UW-Pesa Web Portal

Server for CSE 490c
https://class.uwpesa.com/

APIs to interact with class.uwpesa.com
https://documenter.getpostman.com/view/5162128/RWgwQvKP
Brief Overview of USSD
Why is USSD important?

... majority of large scale mobile financial services (MFS) deployments in the developing world use USSD as their primary mechanism for communication between customers and their mobile payments platform.

— CGAP, 2015
A Typical USSD Flow
Research Complexities

- Non-commercial research on USSD is rare due to the complexity of running the entire USSD stack.
- Using real phones requires integrating with a telco network:
  - Probing the security of a running commercial network is unethical and/or illegal.
  - Running your own network requires a spectrum license.
Becoming a research telco

- Cellular networks operate in licensed spectrum
- Coordinated in the United States by the Federal Communications Commission (FCC)
- Granted a license to run a research network in GSM-900e band on the UW campus
The UW-Pesa Network

- **Commercial Off The Shelf Phones**
- **GSM-900**
- **Open Source GSM Network (Required Patches)**
- **Custom Airflow SUP Connector**
- **Local Virtual Machine**
- **UW-Pesa Backend Service**
- **Software Defined Radio**
- **Ettus Research**
- **osmocom**
Demo Overview

Joseph Adoyo
Gender: Male
DOB: 5 June 1977
Phone No: 40001

Joseph has a job in Nairobi. His family (wife, three kids, and parents) lives in a town 100 miles from Nairobi. Joseph sends money home every two weeks using UW-Pesa.

Mary Adoyo
Gender: Female
DOB: 17 September 1975
Phone No: 40003

Mary, Joseph’s aunt, lives alone in Magadi, a town 70 miles from Nairobi. Occasionally she receives money from Joseph through UW-Pesa. She withdraws the money through an agent. She hasn’t yet registered for UW-Pesa.

Dennis Adoyo
Gender: Male
DOB: 25 May 2002
Phone No: 40002

Dennis is Joseph’s eldest son and takes care of the family while Joseph is away. He receives money from Joseph through UW-Pesa.

(Agent) David Otieno
Gender: Male
DOB: 15 September 1972
Phone No: 30000

David is a UW-Pesa agent. He runs a small mobile shop. To stay competitive in the agent market, David offers excellent customer service, managing his float well and going out of his way to help his customers.
UW-Pesa Team

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