Bekoz

Free Mobile-to-Mobile Money Transmission Revolutionizes Trade Between the Poorest in Africa

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Goal

Technology can help the poor to help themselves

Learn how one company designed and built a secure, handset-independent, mobile banking application using SIM Tool Kit on Java Card™ technology-based SIMs

Agenda

- The Bekoz Approach to Money Transfer
- Services in Underdeveloped Countries
- Java Card Technology-based SIMs
- SIM Toolkit Framework
- Transaction Security
- Banking for the Un-banked
- Current Status and Future Plans
- Summary

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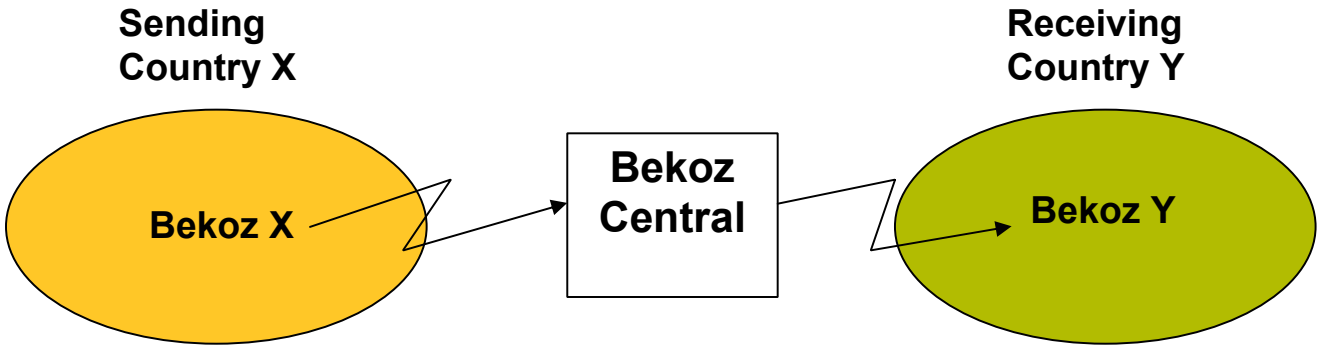
International Remittances

- Global remittances estimated to be $268B USD in 2006 **Source**: World Bank
- Global remittances forecasted to grow to $345B USD by 2008 **Source**: Celenet, Boston MA
- Migrant remittances from the United States to Latin America reached $62.3B in 2006 **Source**: Inter-American Development Bank
- It is estimated that UK immigrants sent £2.7B in remittances to their home country **Source**: Department of International Development, UK
- International transmission market currently dominated by Banks and specialist firms with extensive network of offices

Bekoz Plan

- Use Disruptive Technology
- Significantly reduce the 25–30% average fees associated with every transfer
- Paying-in fee
- Paying-out fee
- Express payment fee
- Currency Exchange fees
- Provide the best currency exchange rate
- No Charges for the user
- Make money from top up + other services

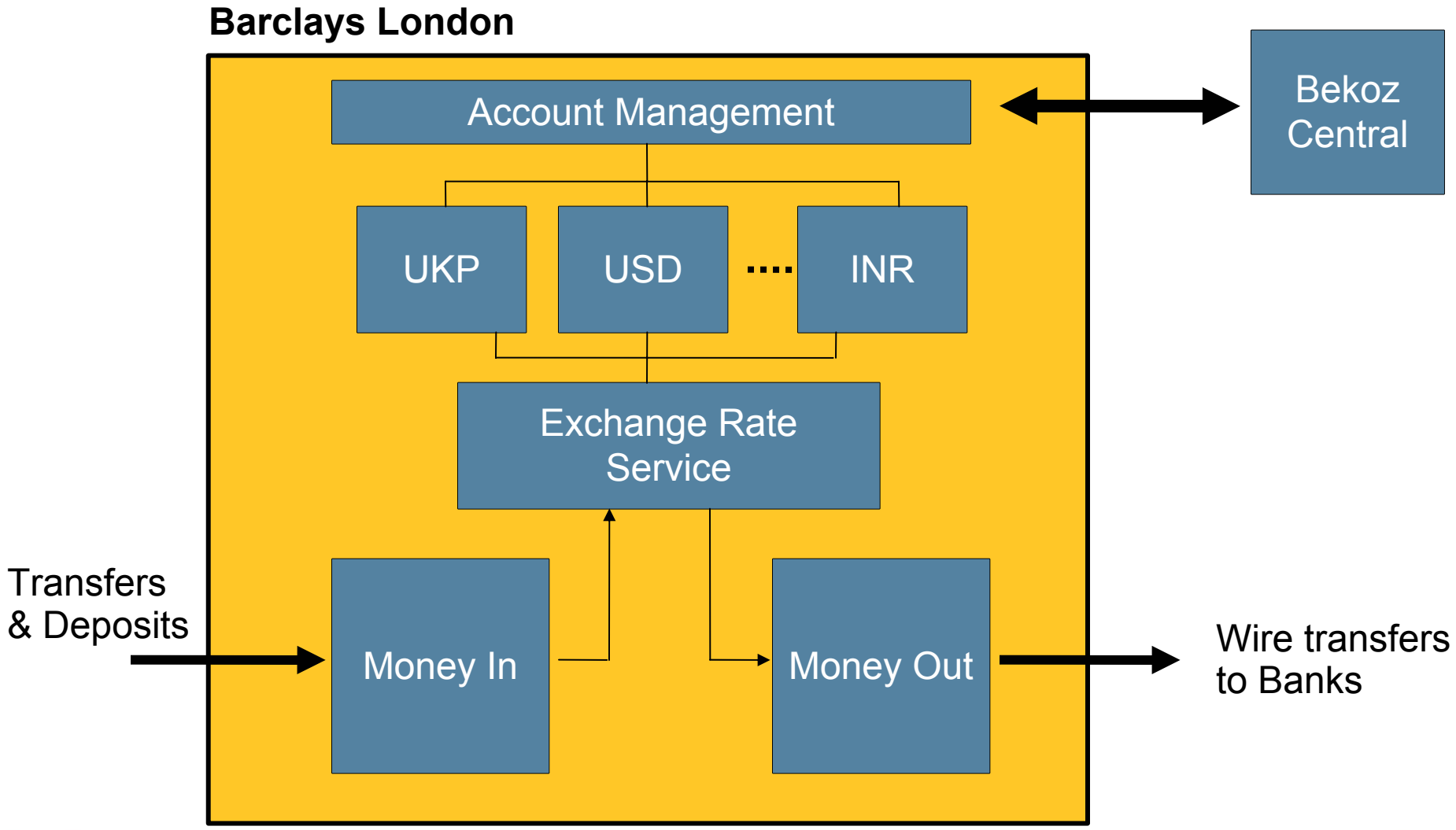
Bekoz Money Transmission Service



Bekoz Central

- Computer system based in Pune, India
- General purpose transaction engine originally used for credit card transactions
- Designed to run on Sun hardware running Solaris™ Operating System (Solaris OS)10
- All transactions use this central facility
- All communications via Internet
- System provides 24x7 help desk
- System provides all Customer Service screens

Monies Held in Barclays London



Money in Is Easy

- Transfers made from countries with good banking infrastructure
- Paying in methods
- Deposit over bank counter
- Transfer using Internet banking
- Standing Order from bank account
- Direct deposit from payroll
- Posted check
- Deposits typically around $200 per transaction
- Regular sending is the norm

Money Out Is Difficult

- Easy if recipient has a bank account
- Hard if un-banked
- Have to identify the recipient
- Find a secure location for money out
- Quickly reverts back to need for offices
- Proposed cost savings cannot be realized
- Need an alternative model for poor recipients in third world countries

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Third World Attributes

- Huge proportion un-banked
- Poor infrastructure
- Limited education
- Low funds
- Deep sense of culture and community
- High expectations

Services in Underdeveloped Countries

Source: International Telecommunications Union, The World Factbook CIA.

Mobile Subscribers (2006)

Region	Population ('000s)	Mobile Population ('000s)	Mobile Penetration (%)
World	6,396,558	2,168,433	33.9
Europe	800,324	676,274	84.5
Americas	884,164	458,881	51.9
Asia	3,774,703	875,731	23.2
• Africa	• 900,093	134,014	15.0

Source: International Telecommunications Union, The World Factbook CIA.

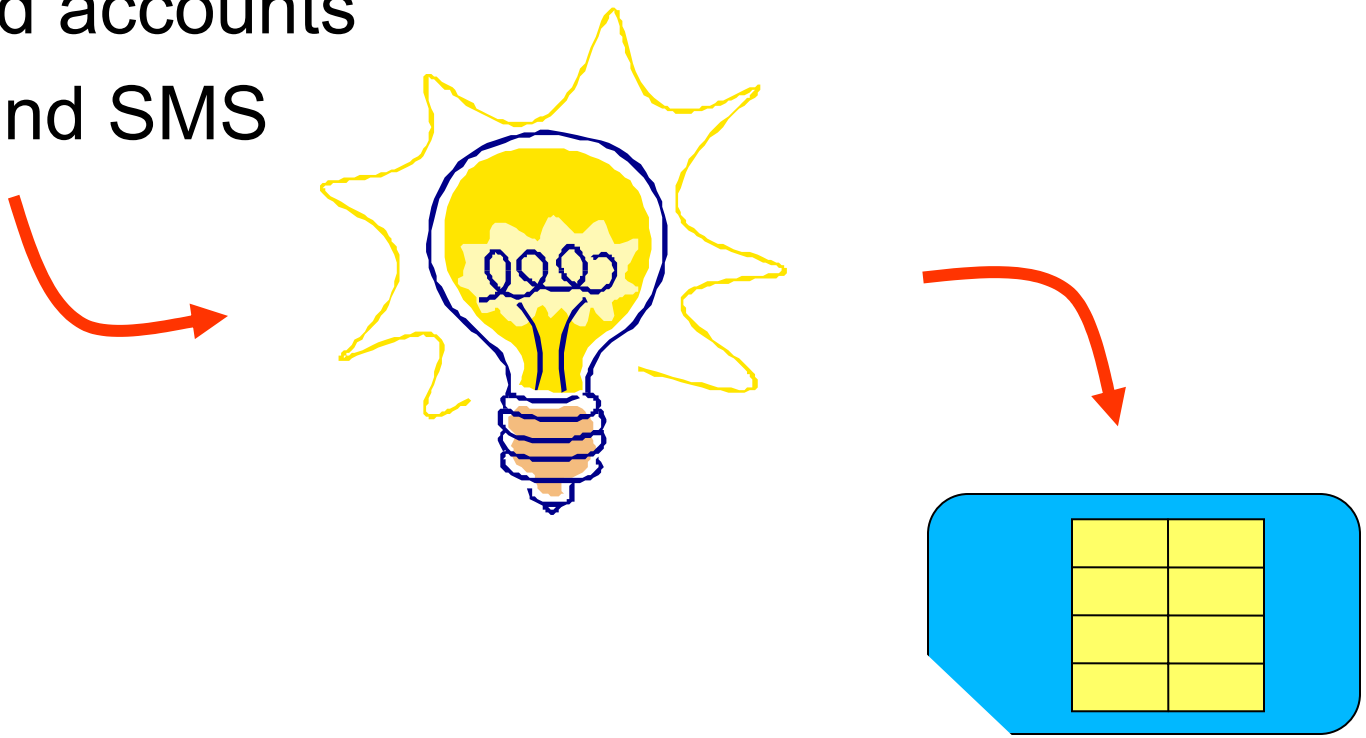
African Mobile Subscribers

Country	Population 2005 (m)	Mobiles 2000 (K)	Mobiles 2005 (K)	2000 - 05 %CAGR	Per 100 inhabitants	% of total telephones
Botswana	1.640	222.2	823.1	29.9	50.19	86.2
D R Congo	62.66	15.0	2746.0	183.5	4.38	99.6
Guinea	9.69	42.2	189.0	35.0	1.95	85.5
Liberia	3.04	1.5	160.0	154.5	5.26	95.9
Mozambique	19.68	51.1	1503.9	96.7	7.64	95.6
Zimbabwe	12.24	266.4	668.0	20.2	5.46	67.1
Whereas:						
UK	60.61	43.5	65.5	8.6	108.06	67.3
USA	298.44	109.5	213.0	14.2	71.37	54.8

Source: International Telecommunications Union, The World Factbook CIA.

Mobile Based Banking—How?

- GSM
- Basic (old) Handsets
- Pre-paid accounts
- Voice and SMS



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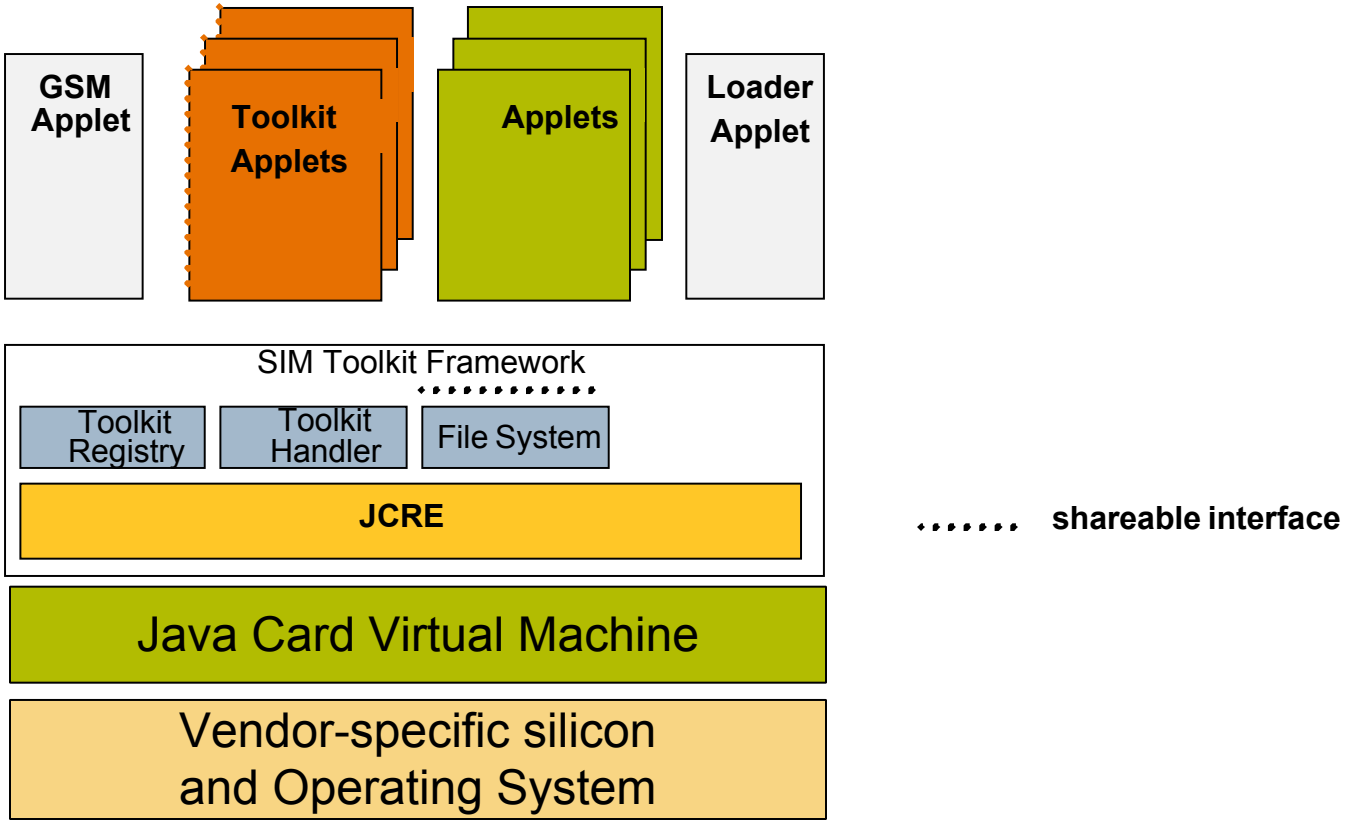
Subscriber Identification Module (SIM)

- Universal—all GSM phones have a SIM
- Over 50% of all SIMs based on Java Card technology Source: SIM Alliance
- Allows the Bekoz application to run on the SIM rather than the phone
- Application runs on “old” phones
- Provide security in a tamper-resistant module
- Transactions controlled by USER PIN
- SIM cards being supplied by Sagem Orga

GSM Java Card Technology Architecture



- **SIM Toolkit Framework:** The GSM Java Card runtime environment

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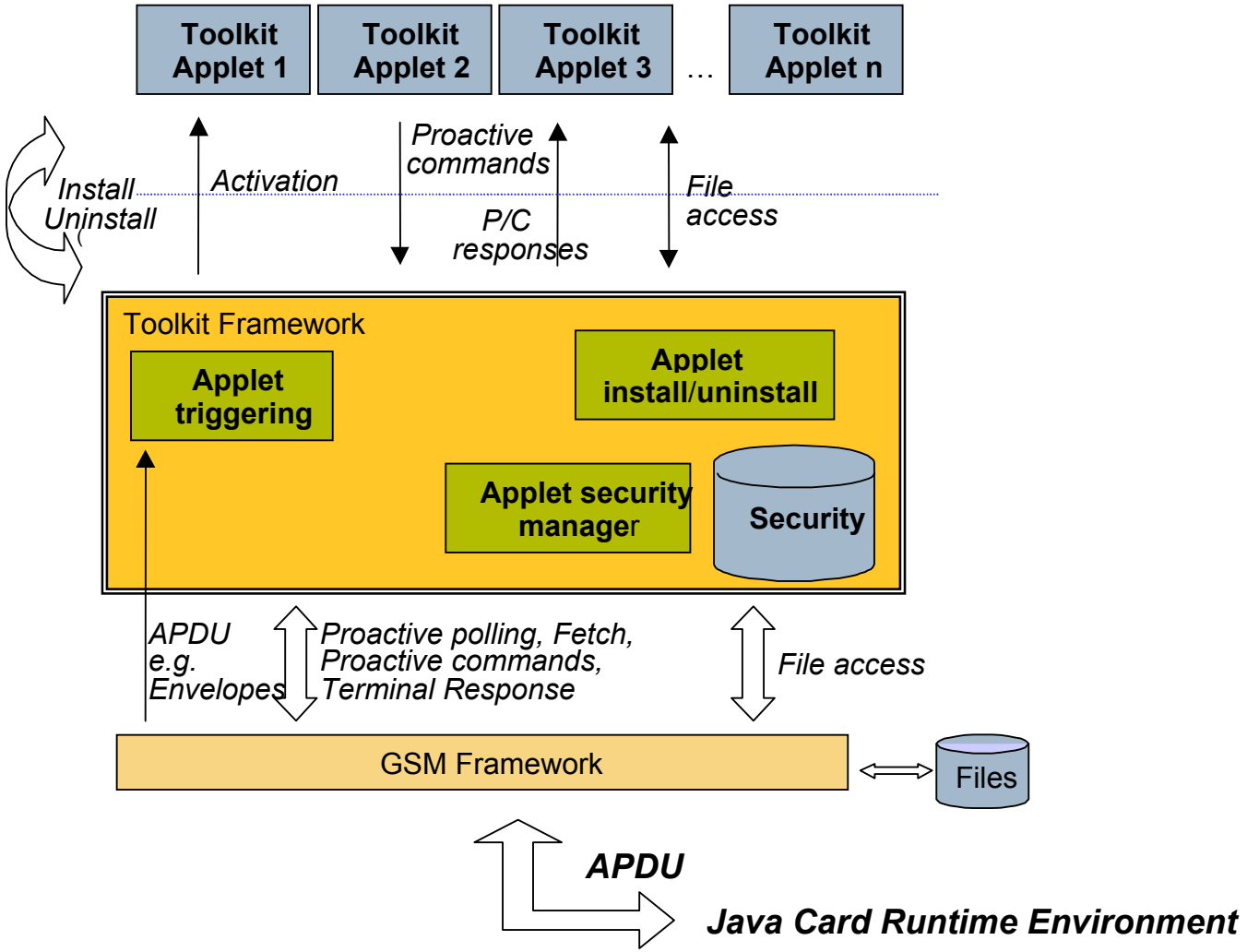
SIM Toolkit Framework



The Bekoz Application

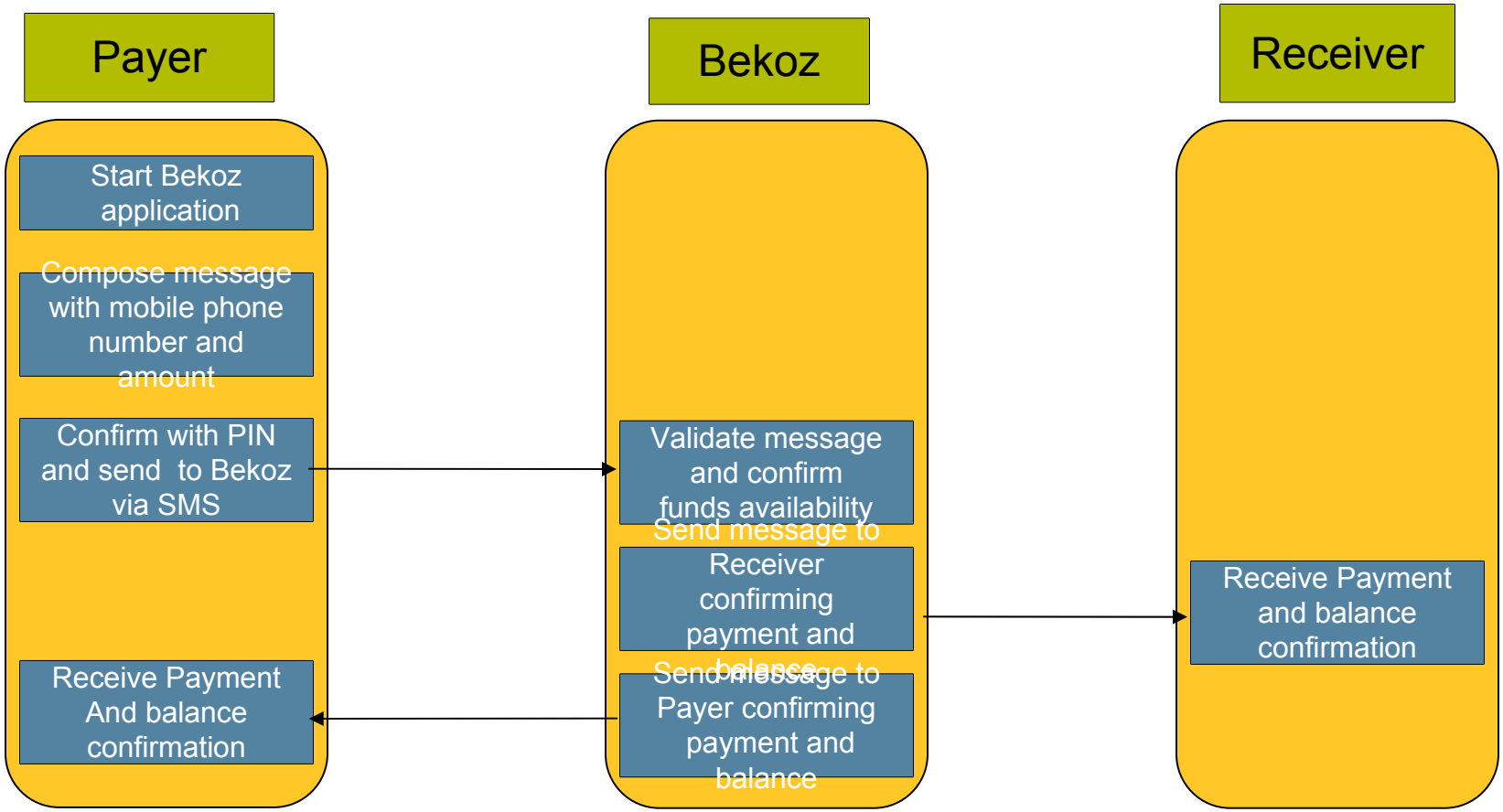
- SIM toolkit application running on a Java Card technology-based SIM
- User communication through phone screen and keypad using menu structure
- Bekoz Central communication through SMS
- All transactions protected by user PIN
- Bekoz account identified by the user's mobile number in international format

+{country code} {area code minus zero} {number}

Bekoz Account Setup

- Provide contact information to mobile operator
- Replace old SIM with new Java Card technology-based SIM containing Bekoz Application and OATH secret keys
- User enables application by selecting it and entering a new PIN
- Bekoz application sends SMS to Bekoz Central to activate account
- Bekoz account ready to receive funds

P2P Payment Process



Move Money Mobile to Mobile

Handset with received funds

Operator
Phone-to-Cash (P2C)

Retailer
Phone-to-Business (P2B)

Friends & Relatives
Phone-to-Phone (P2P)

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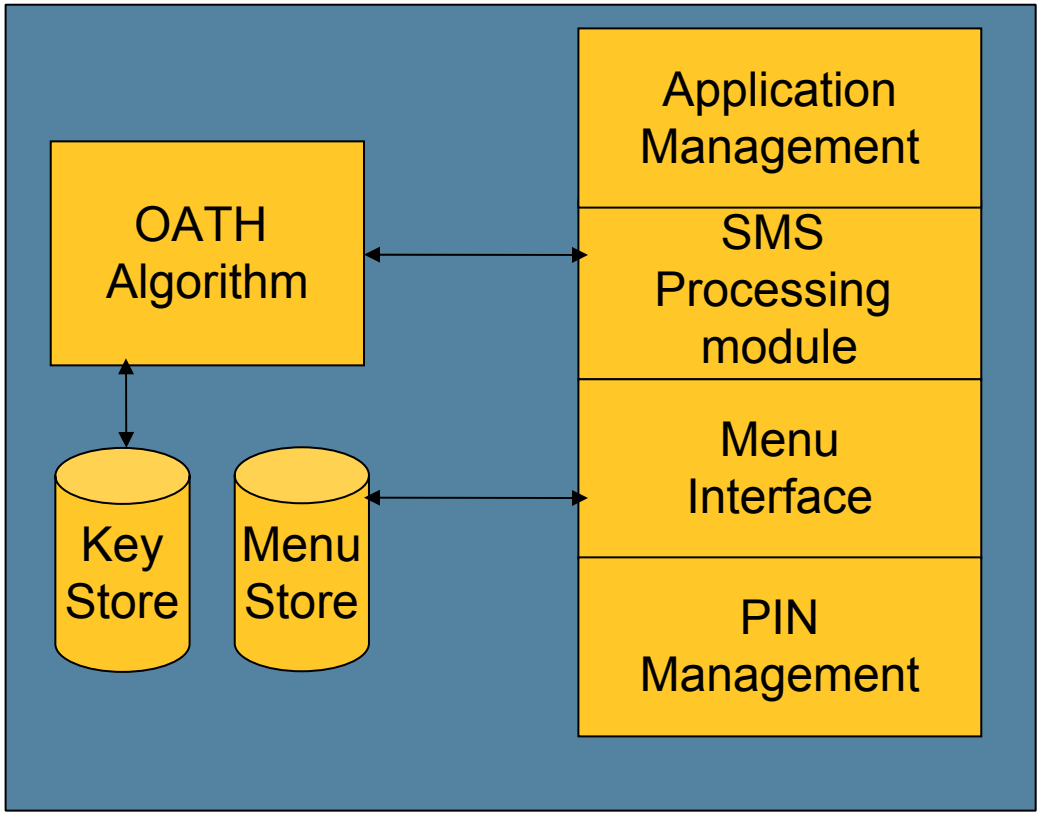
Security of Transaction

- For security, we need to know:
- Identification of user
- Authentication of that identity
- Integrity of the message
- Identification (mobile #) comes from network
- Authentication and message integrity comes from a One Time Password algorithms called OATH
- OATH generates a pseudo-random sequence of numerical passwords.

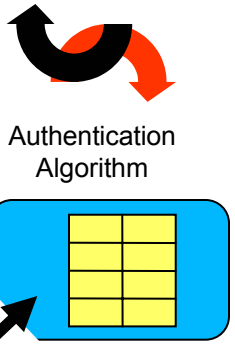
Bekoz Application Components

- Menu data
- Oath algorithm
- Oath secret keys
- PIN management
- Inititial
- Change
- Menu update

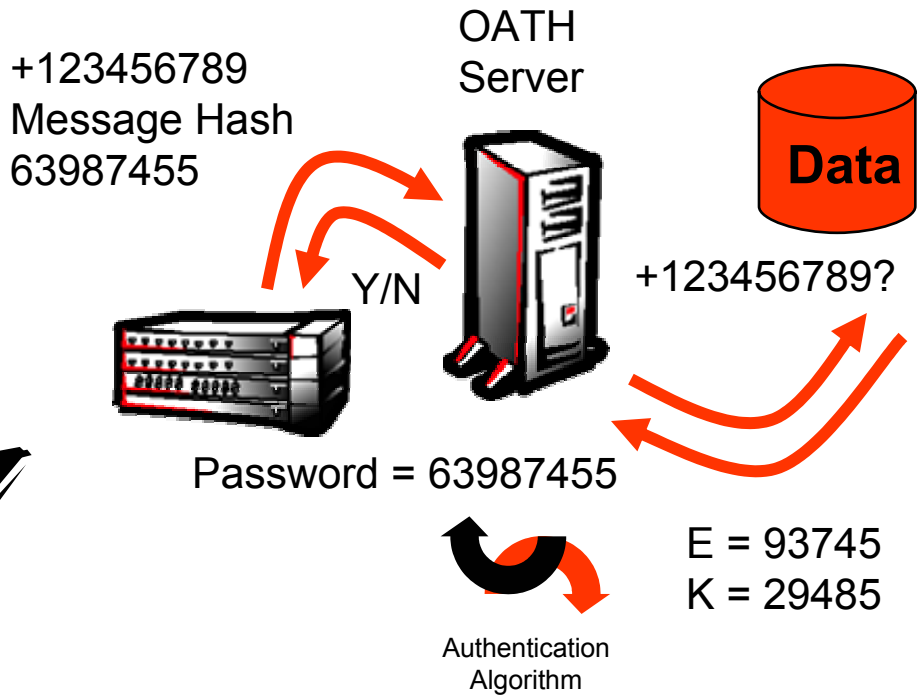


Oath—How It Works

M = Message Hash
E = Event Counter
K = Derived DES Key



Bekoz Central



SMS from Mobile No: +123456789

Send	USD	12.32	+44987654321	63987455

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Default Banking System

- Bekoz may become THE banking system for the un-banked in many Bekoz countries
- Without Banking
- Cannot Buy
- Cannot Sell
- Cannot make a Profit
- No profit = No Trade
- No Trade = Poverty
- A universal and inexpensive payment mechanism is fundamental to trade

Example—Many African Countries

"While rampant corruption and inadequate supervision leaves the banking system vulnerable to money laundering, the lack of a well-developed financial system limits the country's utility as a money-laundering center."

Source: The World Factbook CIA.

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Government Rules and Regulations

- All countries have rules regarding money transmission
- Each country is different
- International money transmission is best seen as a series of “tunnels”
  - US to Mexico is different than UK to Mexico
- Need to know the identity of the sender
  - Name
  - Address
- Need to obey national and international anti-money laundering rules

Current Status

- Liberia
- Contract signed
- First transactions in Q2 2007
- Guinea
- Contract signed
- Zimbabwe, Lisotho, Botzwana
- Contract agreed, signing expected Q2 2007
- First transaction Q4 2007
- D R Congo
- Discussions ongoing

Future Plans

- Prove technology works for third world
- Prove business model is successful
- Extend to other African countries to enable trade between African nations
- Offer customized interfaces for other services
- Microlending
- Micro insurance
- Offer direct interfaces for employers wishing to offer money transmission services to employees
- Eventually extend service to Philippines, China and Indian subcontinent

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Conclusion

- International Remittance business was worth $268Bn in 2006 and is growing strong
- Business dominated by Banks and specialist companies with large network of offices
- Bekoz wanted to reduce the cost of money transmission
- Problem of un-banked receiving funds solved through use of Java Card technology-based SIM in Mobile handset
- Enabled handset independent Mobile to Mobile instant transfer of funds
- Created a free to use banking system for the un-banked
- Basis of other services such as Micro-finance

Q&A

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