

Digital Financial Services in Agricultural



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AGENDA

- Introduction
- Background: Agriculture & Digital Finance
- Savings
- Credit
- Insurance
- Role of Data in Agricultural Finance
- Customer Protection
- Activity

BACKGROUND: AGRICULTURE & DIGITAL FINANCE

Agriculture in Africa

The agricultural sector in Africa is largely;

- fragmented
- lacks transparency
- has inefficient processes
- lacks coordination.

This results in low yields, weak small-holder farmers and inefficient farming methods.

There is an opportunity for Digital Financial Services (DFS) to address some of the key challenges, with a special focus on addressing the needs of small-holder farmers who form the vast majority of farmers in Africa.

Challenges run through all activities...



**Production
/Harvest**



**Post Harvest,
Processing**



Customer

- Poor linkages between farmers, Financial Services Providers, seed producers, input dealers, research/extension services
- Production decision not based on demand

- Poor farming practices
- poor quality of seed & no/low quantity fertilizer
- Limited extension services

- Poor quality produce
- Poor storage practices
- Poor packaging

- No varietal uniformity, post processing
- Lack of structured markets

Nigeria...



Demographics

182M people
Africa's largest market
69M employed



Food Expenditure

- **21M** MT increase in food productions from 2011-2014
- **403%** reduction in food imports



Income

\$481B GDP (2015)
~**\$20%** of GDP is Agriculture
16.5% Inflation



Telecommunications

149M active mobile subscriptions
92M Internet Users
Low Mobile Money Penetration



Land

84M Hectares of arable land
40% Cultivated
230B Cubic meters of water
66% of territory has abundant rainfall

Nigeria's Agricultural Transformation Agenda (ATA)

Some Key Programs & Projects:

- Growth Enhancement Support Scheme (GESS)
- Agricultural financing
- Value chain development
- Farm mechanization
- Staple Crops Processing Zones (SCPZ)
- Nigeria Incentive-Based Risk-Sharing System for Agricultural Lending (NIRSAL)

SPOTLIGHT ON RUFIN

The Rural Finance Institution Building Programme (RUFIN) is a Loan Agreement of US\$27.2 million between the International Fund for Agricultural Development (IFAD) and the Federal Government of Nigeria.

OBJECTIVE: To develop and strengthen Micro Finance Banks (MFBs), other member-based Micro Finance Institutions (MFIs), by enhancing the access of the rural populace to the services of these institutions in order to expand and improve agricultural productivity and Micro-Small Rural Enterprises

Implementation:

- **3,516** Rural Microfinance Institutions have been linked with formal banks
- A total of **N66.6M** of voluntary savings have been mobilized from **31K** savers in the 12 participating states.
- 44.68% of these savers were women, **55.32%** were men, **20.69%** were youths and 0.91 % are physically challenged.
- N134M in wholesale credit was provided to the village savings and credit associations for onward lending

Key Results:

- Access to credit facilities has increased by **122.24%** and savings mobilization increased by **226.23%**

All these policy initiatives have begun to address the structural issues in agriculture; including Finance.

How do you leverage the digital channel to **engage, acquire, serve** and **retain** agricultural customers.



Approaching Digital Financial Service in Agriculture. A focus on:

SAVINGS

CREDIT

INSURANCE

Some Factors To Consider before deployment

POPULATION

**AGRICULTURAL
POPULATION**

**FINANCIALLY
INCLUDED**

**MOBILE
PENETRATION**

**MOBILE MONEY
PENETRATION**

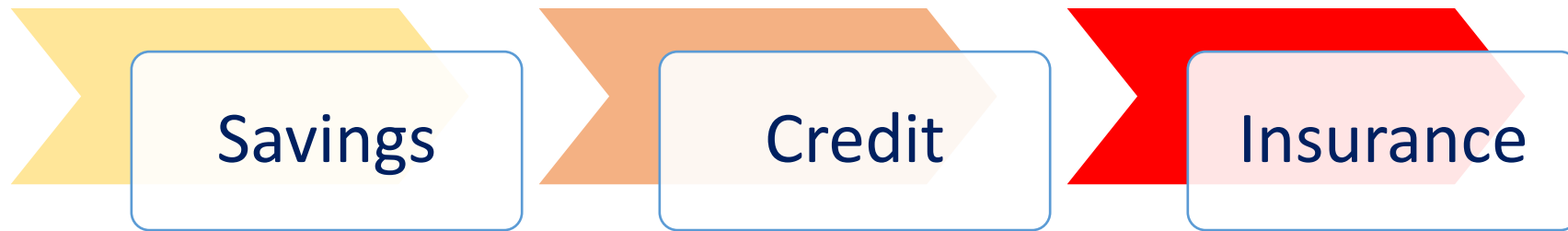
**AGENT
NETWORK**

ID SYSTEMS

GOVT. POLICIES

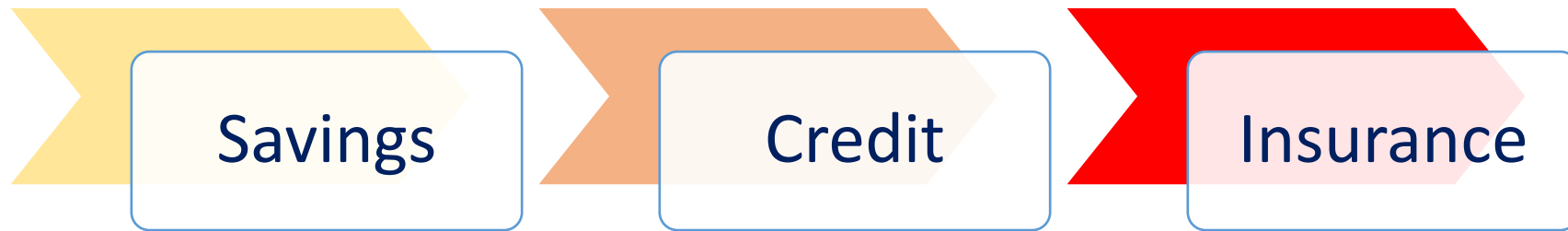
**AGRICULTURAL
VALUE CHAIN**

Managing Expectations: Complexity



Most successful Digital Savings, Credit and Insurance products have been done through partnerships. It's an opportunity to share revenue, risks and any unforeseen challenges especially in the agricultural space.

Managing Expectations: Cost



Although DFS products do not require the brick and mortar investments that conventional products do, they come with their own costs including **customer data, transaction fees, call center, HR, communication and credit scoring.**

SAVINGS

Digital Savings

The need for savings in the rural/agricultural space has largely been driven by Security, Speculation and Emergency.

For the purposes of developing digital products, customer need for savings can be classified into types:

1. Store (e.g. Susu)
2. Save (Earn interest)

Store

- Rural dwellers and small holder farmers need the opportunity to keep their money safe (from theft, destruction, social pressure etc.).
- They have historically found creative ways to meet this need including hiding cash under mattresses and unmarked “pits” on the farm
- **A Mobile Wallet is all it takes to meet this need.**
- Transaction on this wallet is basically Cash-Ins & Cash-Outs
- E.g. Tigo “Susu” in Ghana

Save

- A step above providing customers with a secure digital means of storing funds is providing interest.
- Interests paid on the valued stored in wallet either as a “Demand Deposit Account” or “Term Deposits Account”
- Term deposits within the rural/agricultural market requires the application of strong customer protection principles
- This product should ideally be deployed in a “secondary wallet”
- E.g. Tigo Sugira (Rwanda)

Benefits

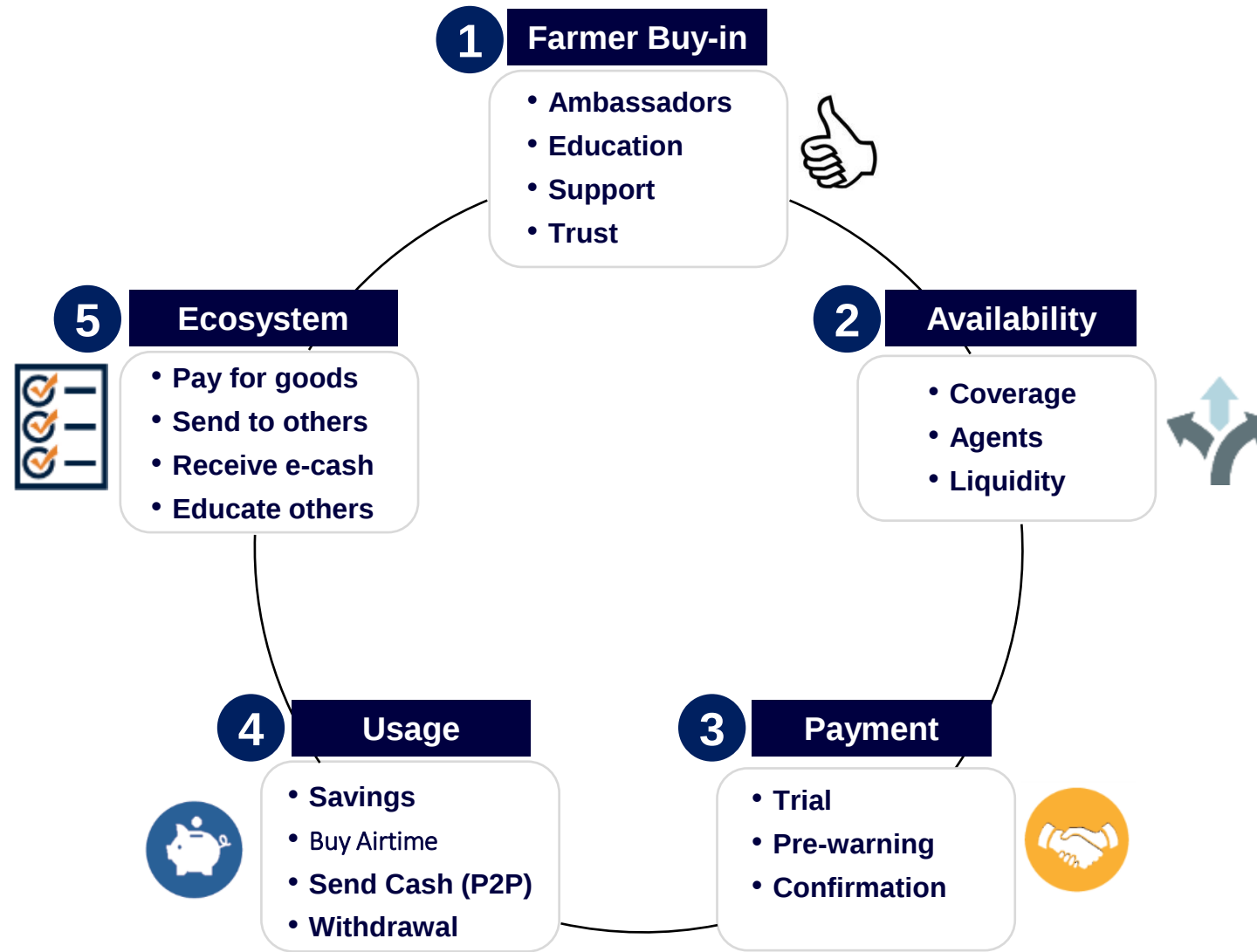
- Meets a compelling customer need for storing value
- Provides Customer Convenience if a strong agent ecosystem exists (for Remote deposits and withdrawal)
- Lower Cost and Risk
- Forms the foundation of credit history



Group Savings

- Another example of a Digital Savings Account is a Group Savings Account. This is another existing practice in rural communities that can be digitized
- Allow customers to create groups with approvers and admin(s) similar to a “WhatsApp Chat Group”
- It requires the incorporation of simple governance rules such as approver, secondary approver and requestor designations etc.
- Ideal for social and religious groups

Getting smallholder farmers over the digital hurdle

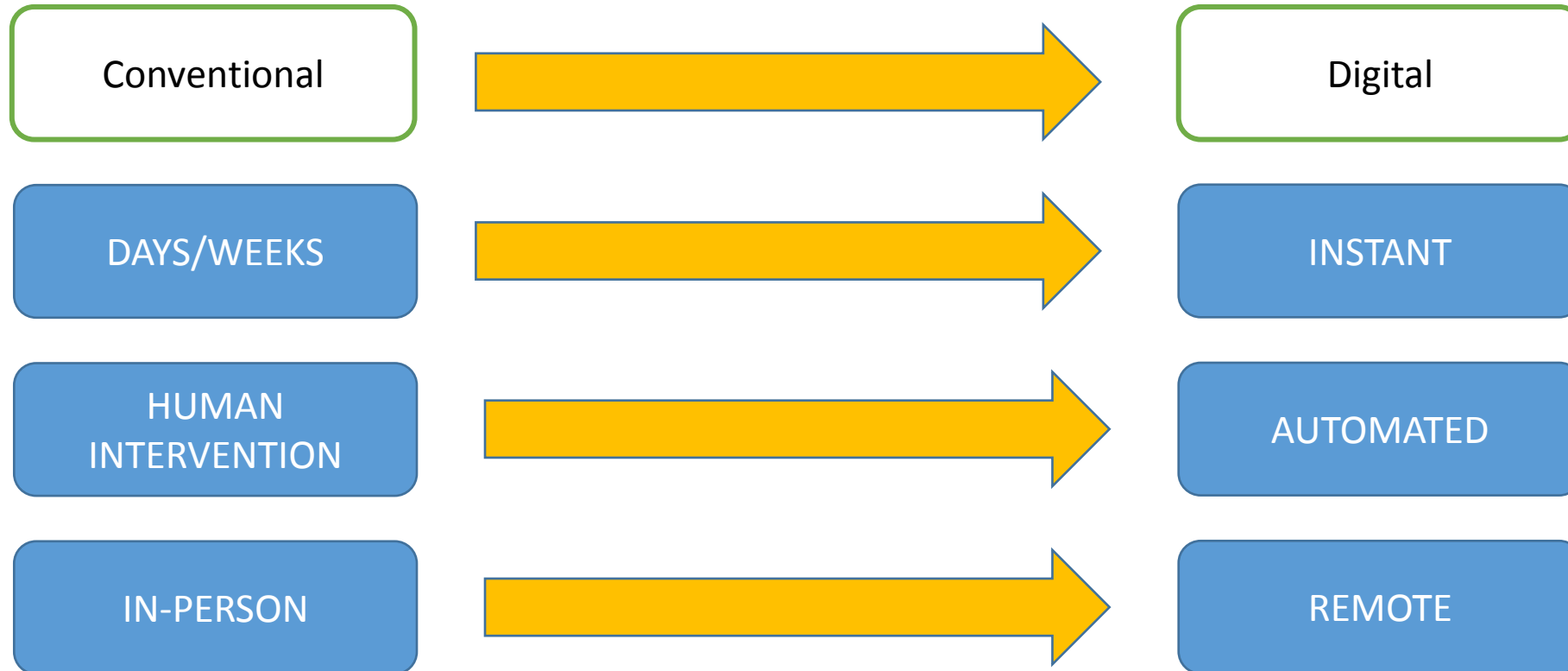


DIGITAL CREDIT

Nature of Digital Credit

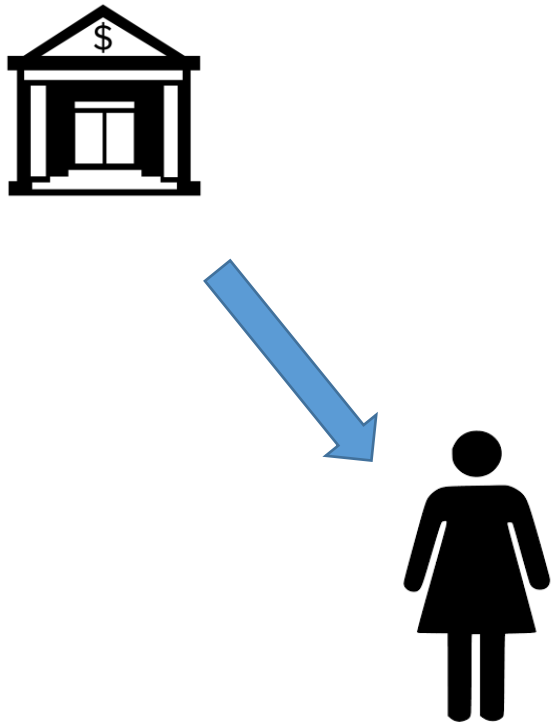
1. Often small loans
2. Quick repayment (less capital needed for credit portfolio)
3. High initial costs (due to small loan sizes and higher credit losses)
4. Cost Reduces with scale and uptake

Conventional Credit vs Digital Credit

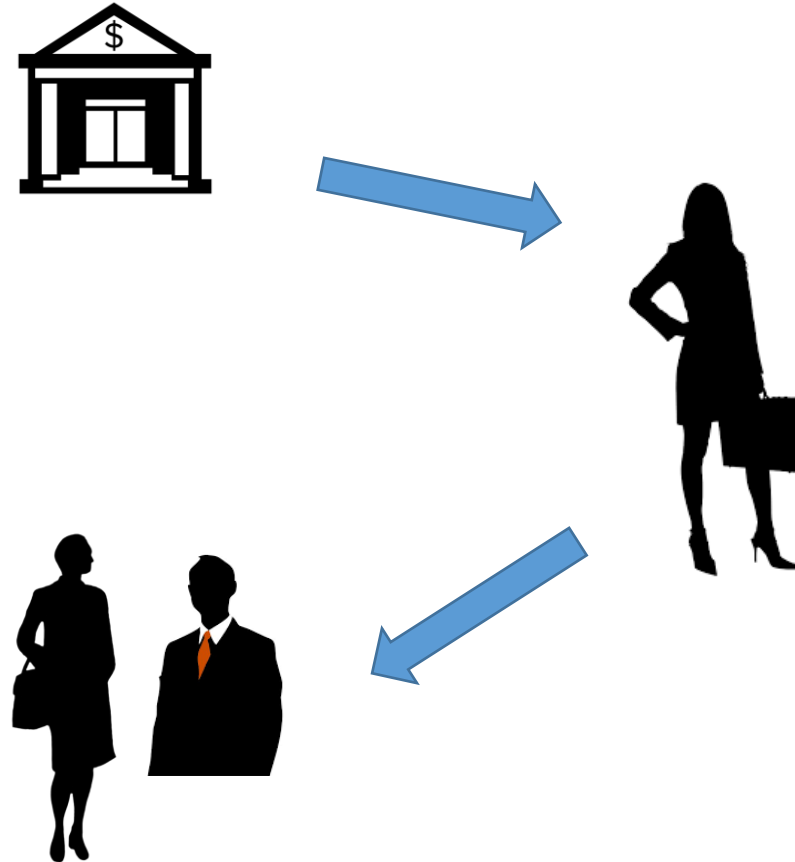


3 Approaches to Lending

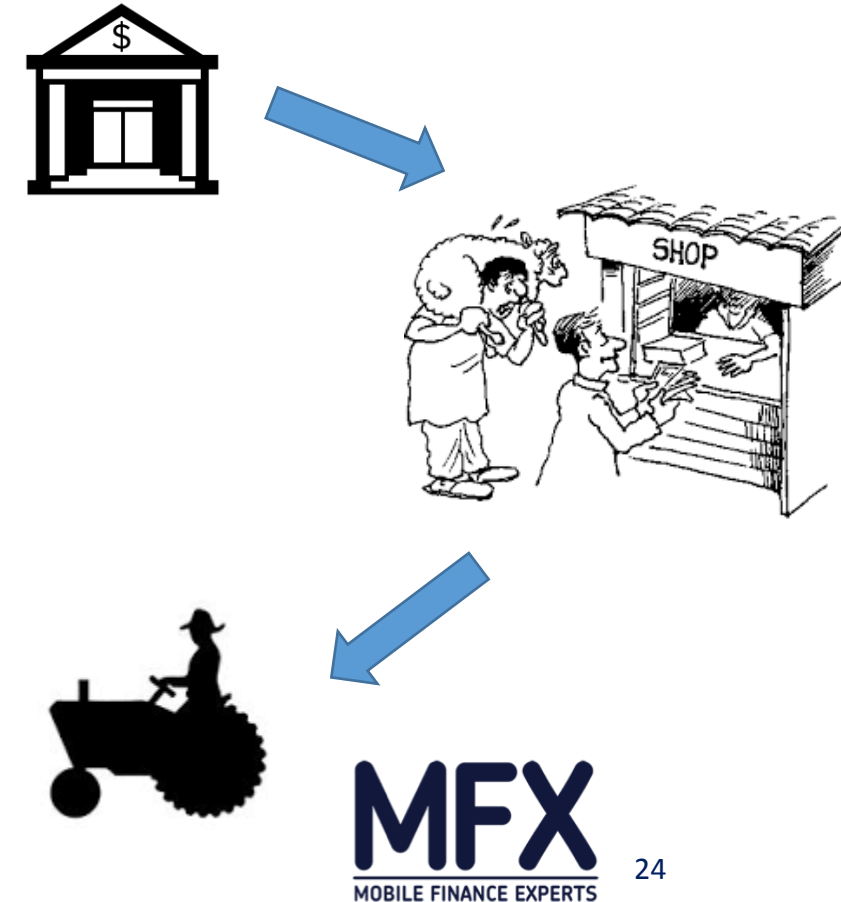
Direct To Customer



Through Merchant Acquirer/Distributor

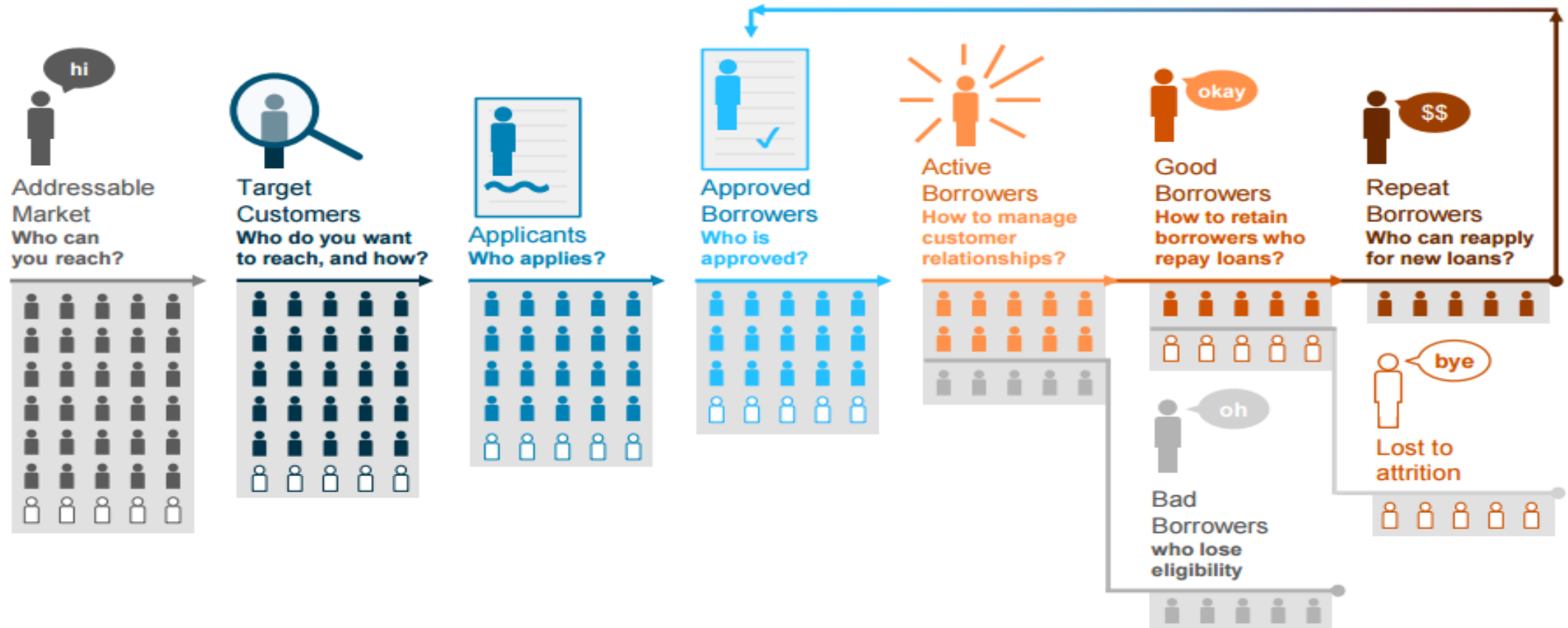


Through Value Chain Aggregator



Direct To Customer

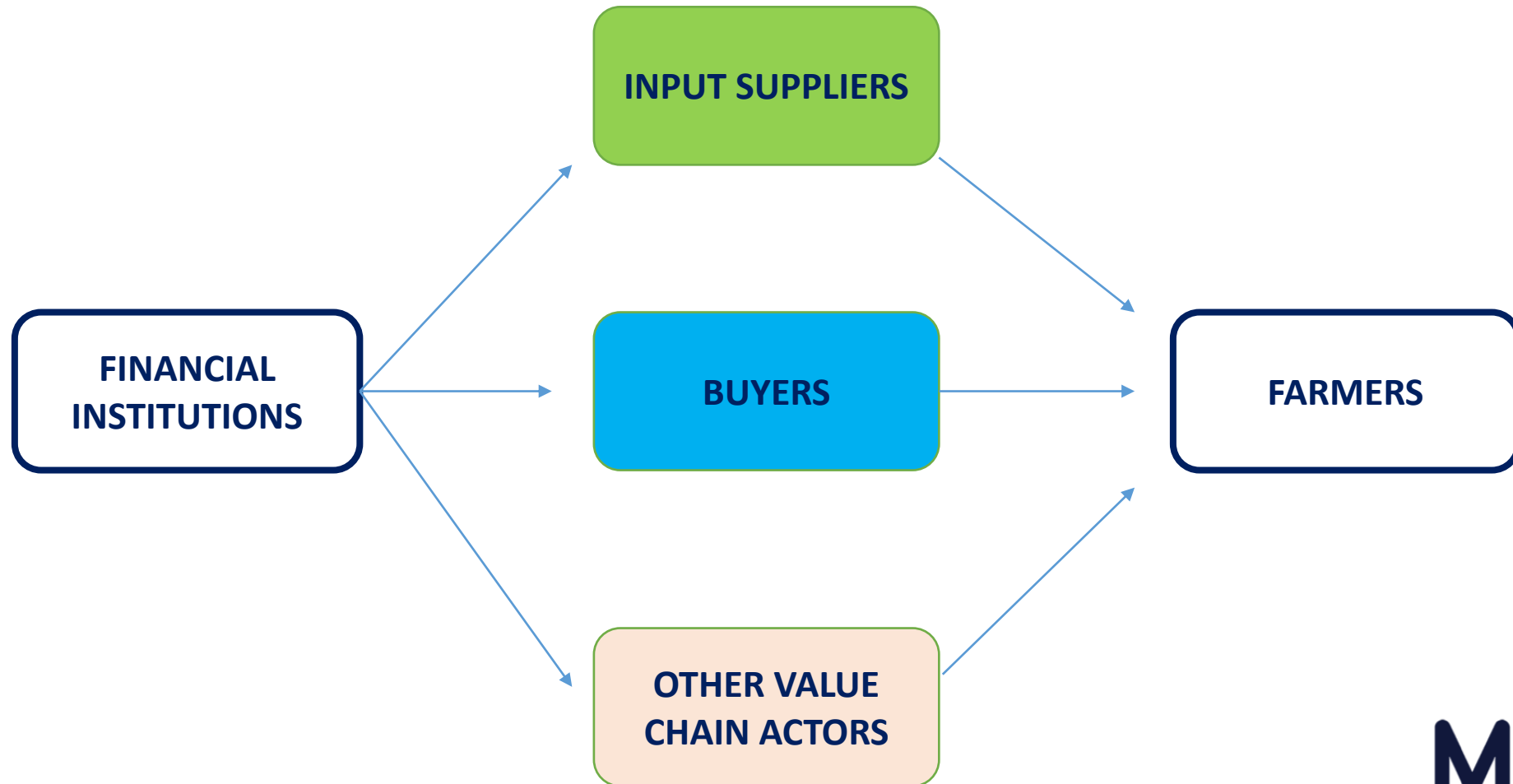
How Digital Credit Works



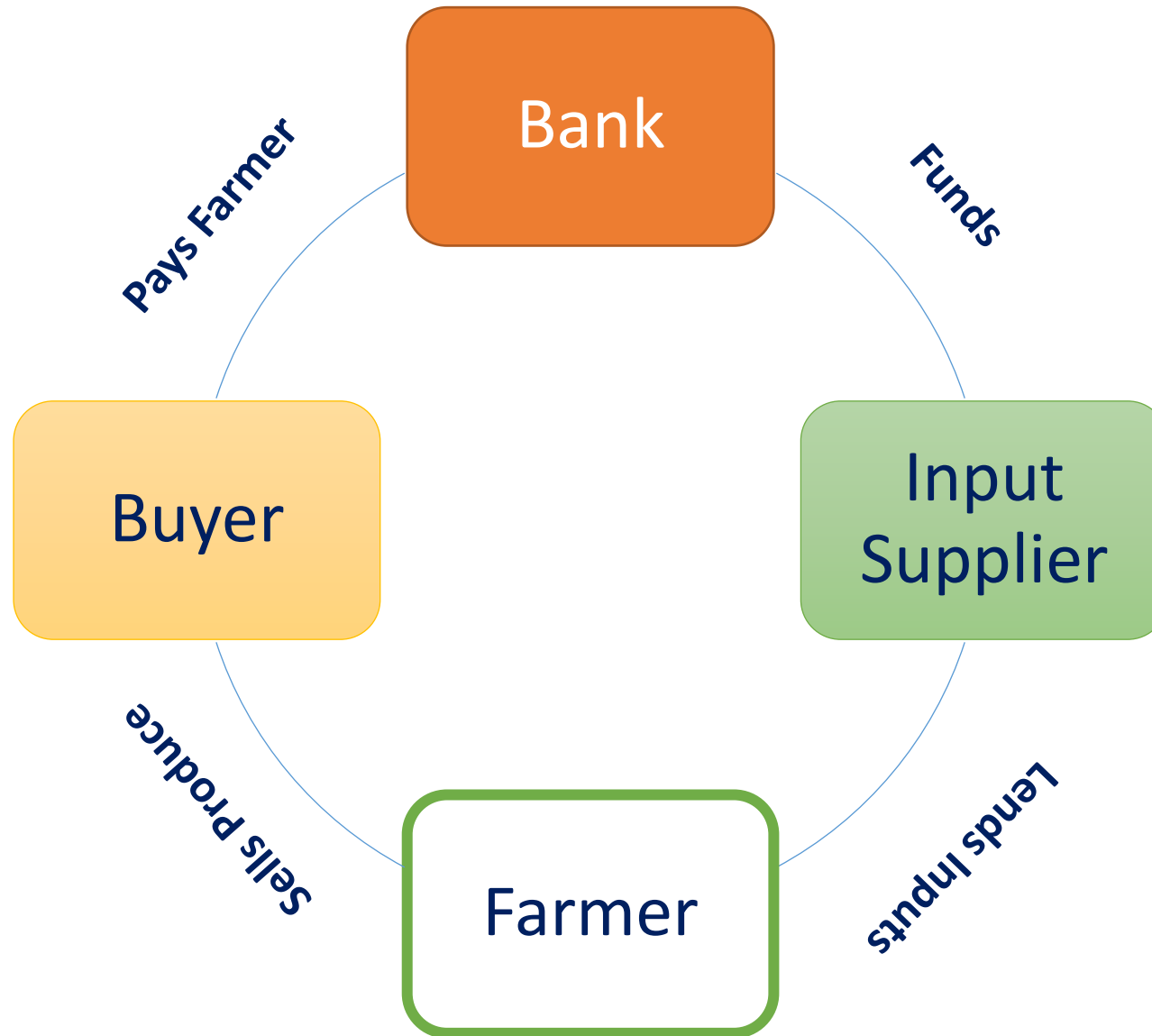
Source: CGAP, Jamal Rahal, CTEA Technologies and Analytics

Value Chain Model

Reducing Risk via Market Linkages



Value Chain Example



Key Lessons in Digital Credit

USER EXPERIENCE

- Keep it simple and as intuitive as possible
- Support interventions must clear to understand and easily accessible

TARGETTING

- Target profiles need to be well defined
- Credit scoring models cannot overcome adverse selection

INFRASTRUCTURE CHALLENGE

- Absence of ID system, Proper Addresses, Land Registration etc.
- UAV assisted farmland survey for proper valuation

SCORING MODEL

- Keep it simple and as intuitive as possible
- Support interventions must clear to understand and easily accessible

PRICING

- Don't restrict use through pricing or create product "Cul-de-Sacs"
- E.g. charging movement from wallet to Bank Account or Bill Pay

COLLECTIONS

- Have a collections strategy with follow ups and reminders
- BoP users may not be used to strict repayment schedules and implications

Current Providers



KOPO KOPO
CONNECTING MOBILE MONEY TO THE WORLD





DIGITAL CREDIT BUSINESS MODEL SIMULATOR

VARIABLES	DESCRIPTION	INPUT
LOAN AMOUNT	Average Loan Amount in USD	100
DURATION	Term of the loan expressed in days	30
NUMBER OF SUBSCRIBERS	Number of Approved Subscribers (Estimated Approval Rate: 45%)	1,000,000
NUMBER OF LOANS PER CLIENT	Number of times the client borrows in a year	4
ANNUAL LOAN LOSS RATE	Amount written off - recoveries / Average portfolio outstanding	20%
INTEREST OR FEE PER LOAN	Interest (or service charge) levied on client for a single loan	7.5%
PROFIT PER LOAN		USD 20.16
INTEREST OR FEE PER LOAN FOR BREAK-EVEN		2.46%

Insurance

Insurance

- Insurance is a critical piece to the various risks that smallholder farmers face but is the most complex of the 3 products to develop. When delivered properly it's affordable and accessible. Beneficiaries of insurance in agriculture could be the *Farmer, Financial Institution or Input Supplier*

The focus of this section will be on **Crop Insurance**

- There are 2 categories:
 1. Indemnity-based crop insurance
 2. Index-based crop insurance

Indemnity-based Crop Insurance

There are 2 types of Indemnity based insurance:

1. **Named Peril or (Damage Based)** - calculate the value of damage soon after the qualifying event occurs e.g. flood
2. **Multiple Peril (Yield Based)** – This type of Insurance covers multiple events that impact yield. It insures a level of crop yield based on historical averages. If after harvest yield is less than insured level, the farmer receives a payout for the difference at a pre-agreed value

Index Based Crop Insurance

- **Area Yield Index Insurance** is based on the realized average yield of an area and not the actual yield of the insured party. The insured yield is established as a percentage of the average yield for the area using historical data and an indemnity is paid if the realized yield for the area is less than the insured yield regardless of the actual yield on a policyholder's farm.
- **Weather Index Insurance (WII)** Insures against a specific weather parameter measured over a pre-specified period of time at a particular weather station. It can protect against index realizations that are either so high or so low that they are expected to cause crop losses e.g. too much or too little rainfall. Indemnity is calculated with pre-agreed value

Benefits

- **Smallholder Farmer** – Protection against crop losses and become more attractive to lenders
- **Financial Institution**- Protection for agricultural loan portfolio and ability to expand agricultural lending
- **Input Dealer** - Investment protection against losses incurred by farmers to whom they supply input on credit

Challenges

- Generally expensive for farmers
- Is more useful to farmers when other services are available e.g. credit, extension support, markets etc.
- Risks are spatially correlated and difficult for insurers to manage
- Availability of local reinsurance partners and hesitation among foreign reinsurers to partner with local insurers
- Often requires government intervention in developing countries

Examples



Drought insurance for maize farmers in 2011 farming season. Reinsured by Swiss Re



Poultry Insurance, Fish Farming Insurance, Livestock/Blood Stock Insurance, Multi Peril Crop Insurance, Plantation Fire insurance



Subsidized & Commercial Livestock Stock Insurance, Multi Peril Crop Insurance, Subsidized & Commercial Crop Insurance

Role of Data in Agricultural Finance

Operational Strategy

In digital finance, data is mostly collected in a digital format and within a well-defined structure from sources such as Telco CDRs, Smart Phone, Social Media etc.

This data can be analyzed and modelled to help design and execute strategies around;

- **Acquisition**- profiling, selection, scoring and targeting
- **Service Delivery**- disbursement, monitoring, support
- **Value management**- retention, churn reduction, increase usage

Scoring

- Credit scoring one of many tools for calculating the probability of default.
- There are different scorecards depending on the kinds of decisions to be made and data being used
- Building a scorecard requires deep expertise linked to a business strategy
- There is a process to build scorecards for digital credit, and specific statistical tools to measure the predictive power of scorecards;
- The sources of data are rapidly changing in a digital world, requiring new analytic techniques.

CDRs (Call Data Records)

NRT Call Records		Released	Duration	Rel Code
METRIC OR INDICATOR	PROXY			
Socio-demographic information	Age, Gender, and Location	11/16/2011 11:16:58	00:01:34	Normal
		11/16/2011 11:16:05	00:00:41	Normal
		11/16/2011 11:16:11	00:00:42	Normal
Number of calls and SMS both emitted and received	Income	11/16/2011 11:16:07	00:00:43	Normal
		11/16/2011 11:16:06	00:00:41	Normal
		11/16/2011 11:16:08	00:00:43	Normal
Usage level over time (increasing or decreasing usage)	Income Flows and Variability	11/16/2011 11:16:08	00:00:43	Normal
		11/16/2011 11:16:06	00:00:42	Normal
		11/16/2011 11:16:06	00:00:42	Normal
Airtime top-up (average balances, amounts, periodicity)	Income, Obligation-planning and Risk	11/16/2011 11:16:06	00:00:42	Normal
		11/16/2011 11:16:07	00:00:43	Normal
		11/16/2011 11:16:07	00:00:43	Normal
Geocoded location	Location, Movement, and Income	11/16/2011 11:16:06	00:00:42	Normal
		11/16/2011 11:16:06	00:00:42	Normal
		11/16/2011 11:16:06	00:00:42	Normal
Customer since date (using the oldest transaction)	Risk	11/16/2011 11:16:06	00:00:42	Normal
		11/16/2011 11:16:06	00:00:42	Normal
		11/16/2011 11:16:07	00:00:43	Normal
Size of user's network, and location	Social Network and Risk	11/16/2011 11:16:06	00:00:42	Normal
		11/16/2011 11:16:06	00:00:42	Normal
		11/16/2011 11:16:06	00:00:42	Normal
Duration of calls and pattern (day use, weekend use, etc.)	Social Profile	11/16/2011 11:16:05	00:00:41	Normal
		11/16/2011 11:16:06	00:00:41	Normal
		11/16/2011 11:16:06	00:00:41	Normal

Source: CGAP

Mobile Money Transactions

Transaction reference #	METRIC OR INDICATOR	PROXY
Amount		
Fee		
Status (paid, sent, refunded)	Customer since date	Risk
money transfer collection location		
Send date/time	Number of different agents used, sent and cash out	Customer and Agent Cost
Sender ID		
Sender Name	Socio-demographic information	Age, Gender and Location
Sender Surname		
Sender Mobile number	Socio-demographic information sender and receiver	Gender and Location
Sender Gender		
Sending Agent	Geocoded location sent and received	Location, Movement and Income
Commission for sending Agent		
Sending Agent location town	Size of user's agent network, and location	Agent Network
Sending Agent location province		
Cashout date	Size of user's network, and location	Social Network
Recipient ID		
Recipient first name	Usage pattern (day use, weekend use, etc.)	Social Profile
Recipient surname		
Recipient mobile	Average savings, and frequency for sending, receiving and keeping funds in the account	Income Flows and Collateral
Recipient gender		
Cashout agent company name		
Cashout agent commission	Number of transactions sent and received, volume and average amounts, fees, trends.	Income Flows, Customer Value and Cost
Cashout agent location town		
Cashout agent location province		

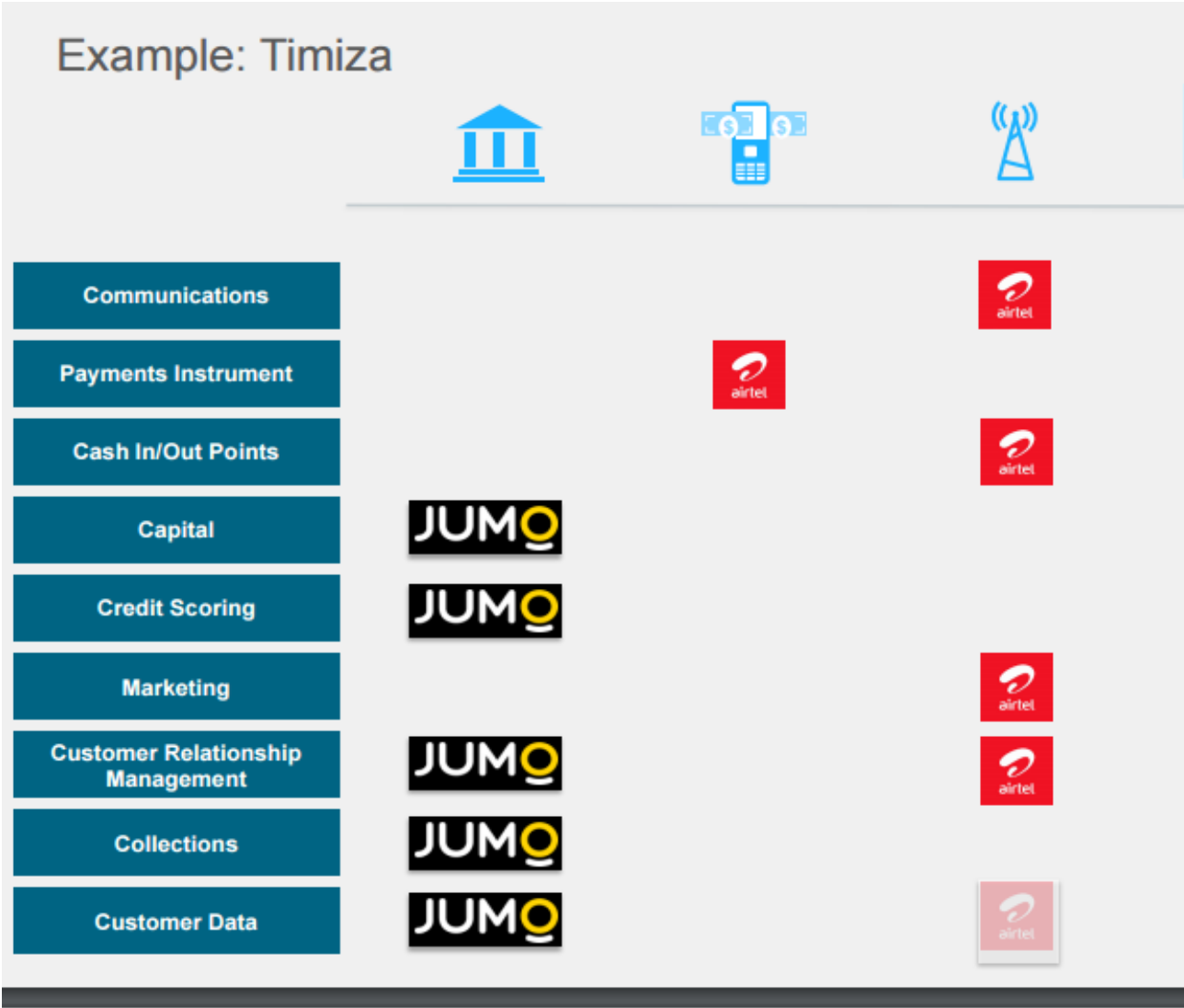
Source: CGAP

Electricity Bill

Bill #	METRIC OR INDICATOR	PROXY
Customer #		
Customer ID (SSN, Nat. ID)	Consumption level	Income and Customer Value
Customer address	User location	Income
Customer area code	Usage pattern (day use, weekend use, etc.)	Social Profile
Year	Household size	Social Profile
Month	Socio-demographic information	Age, Gender and Location
Average temperature	Customer since date, changes in address	Planning and Risk
Heating Degree Days	Payment type, credit card (yes, no)	Banked or Unbanked
Cooling Degree Days	Balance due	Obligation-planning-risk
Total charge (per kwh)		
Calculated consumption (in kwh)		
Amount of bill		
Payment type (check, automatic debit)		
Balance		

Source: CGAP

Activity: Building a Product via Partnerships



Source: CGAP

Customer Protection

Consumer Protection in Agricultural Finance

As part of a broader effort to protect low income, rural and agricultural finance customers, the following principles need to be incorporated into service design and delivery:

- Sufficient Intervention for Customers
- Clear and Simple Pricing Policy
- Full disclosure (Penalties and Delinquency)
- Electronic Data Protection
- Predatory Sales Practices

Thank You!





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