

Supplementary

Profiles of Digital Finance Organizations Leveraging Data and Analytics



Partnership for FINANCE
in a DIGITAL AFRICA

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NOTES

The views presented in this paper are those of the author and the Partnership, and do not necessarily represent the views of the Mastercard Foundation or Caribou Digital.

For questions or comments please contact us at ideas@financedigitalafrica.org.

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The Mastercard Foundation Partnership for Finance in a Digital Africa (the “Partnership”), an initiative of the Foundation’s Financial Inclusion Program, catalyzes knowledge and insights to promote meaningful financial inclusion in an increasingly digital world. Led and hosted by Caribou Digital, the Partnership works closely with leading organizations and companies across the digital finance space. By aggregating and synthesizing knowledge, conducting research to address key gaps, and identifying implications for the diverse actors working in the space, the Partnership strives to inform decisions with facts, and to accelerate meaningful financial inclusion for people across sub-Saharan Africa.

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DIGITAL FINANCE WHEEL

- Color shading to represent the financial services product categories where data and analytics are used within the business model
- 'Payment Services' is also shaded when there is digital / mobile money integration

SOURCES OF DATA

A few different typologies for landscaping big data have been proposed. This research categorized data sources (big data as well as traditional) across four functional categories:

- Individuals' financial services use or history
- Individuals' digital interactions using a device
- Other individual data, such as psychometric survey responses
- Marketwide data, which can be crop prices or satellite imagery as examples

Individuals' financial services use

- Financial services usage
- Credit reference bureau data
- Mobile money behavior

Individuals' digital interactions

- User activity levels, interaction and communication trends
- Social media usage
- Social connections
- Data and voice mobile behavior
- Geographic location

Other Individual data

- Psychometric and behavioral data
- Demographic data / HH information
- Agricultural information
- KYC

Marketwide data

- Satellite images
- Agronomic practices / agricultural data
- Weather, climate and environmental records
- Historical market and income data
- Household surveys, financial diaries, etc.

INTERNAL DATA

- Information obtained directly from / about customers or developed through analysis

Black asset product developed from data obtained internally

Green used internally only

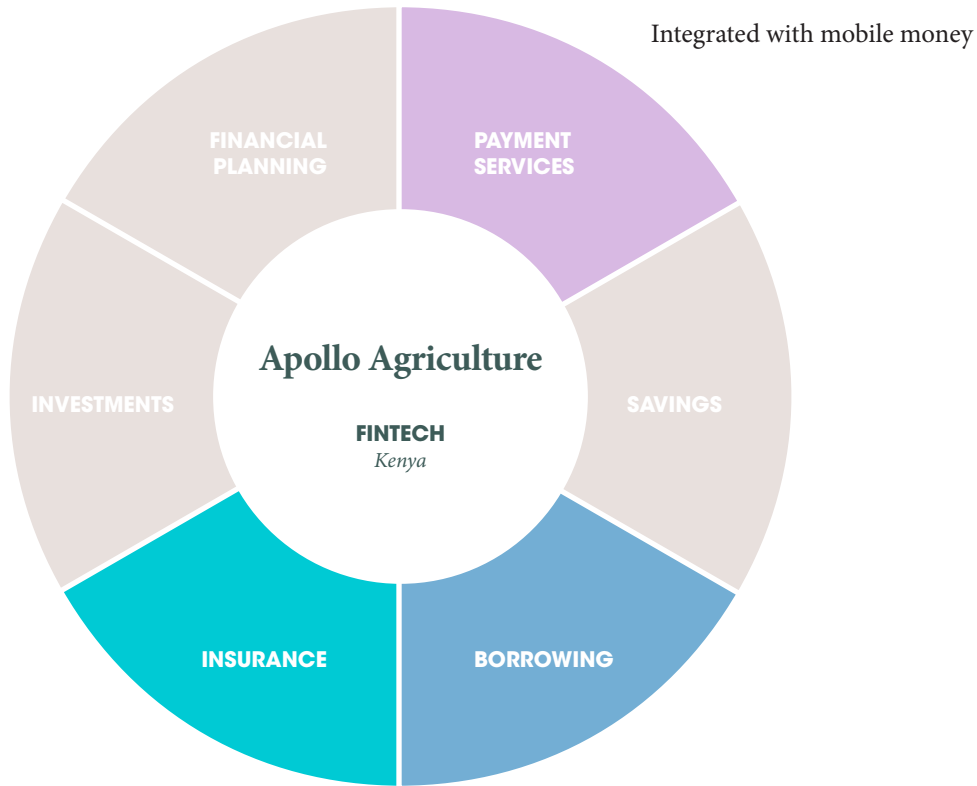
EXTERNAL DATA

- Information obtained from a 3rd party (e.g. externally) or a publicly available data set

Green used internally only



Agronomic machine learning, remote sensing, and mobile technology to help farmers access credit, high-quality farm inputs, and customized advice.



Business orientation: B2C

Sells farmers a package of seed, fertilizer, advice, insurance and credit

- *credit rates customers using data from high-res satellite imagery and behavioral, psychometric, and agronomic data;*
- *trains farmers on best practices via SMS and automated voice calls (“IVR”)*
- *physical product distributed through network of local input suppliers using digital voucher codes*

	INTERNAL DATA	EXTERNAL DATA
Individuals' financial services use	Repayments data	Kenya Credit Reference Bureau <i>(in progress)</i>
Individuals' digital interactions	Communication trends	
Other individual data	Self-reported data from farmers (demographic, financial, agricultural, psychometrics)	
Marketwide data	Data processed from satellite images (size of farm, crops, house size)	Satellite imagery
		Agronomic practices



Digital adviser and education marketplace helping people access information they need in a personalized way.



Business orientation: B2B
Customer management solution

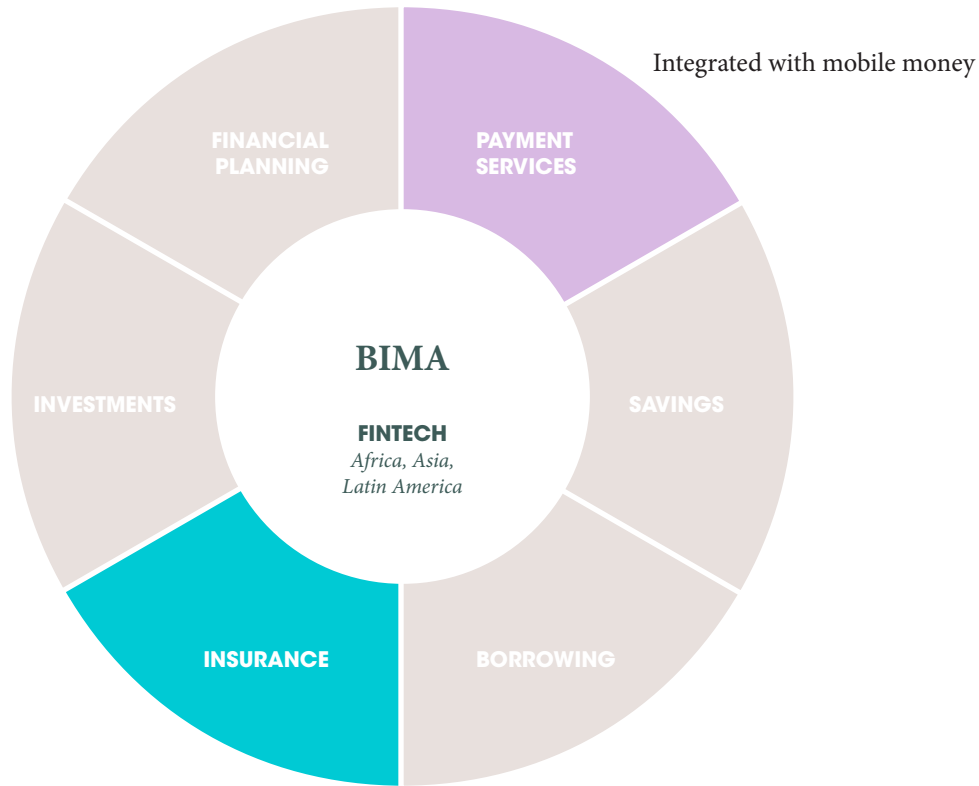
- Adaptive learning system that measures individual user needs and capabilities over Web and SMS in order to offer customized experience and financial education
- Saving and borrowing, information about providers' products and services, and financial services available through mobile phones.

	INTERNAL DATA	EXTERNAL DATA
Individuals' financial services use		
Individuals' digital interactions	User interaction with the service	
	Skills / abilities	
	Social connections	
Other individual data	Customer and agent analytics ¹	
	Age, Gender, Interests	
	Referrals	
Marketwide data		

¹ asset product based on engagement, location, channel, language, grammar, sentiment, goals/progress, leads, feedback on training, referrals, incentive feedback



InsureTech provider of mobile-delivered insurance and health services in emerging markets.



Business orientation: B2B

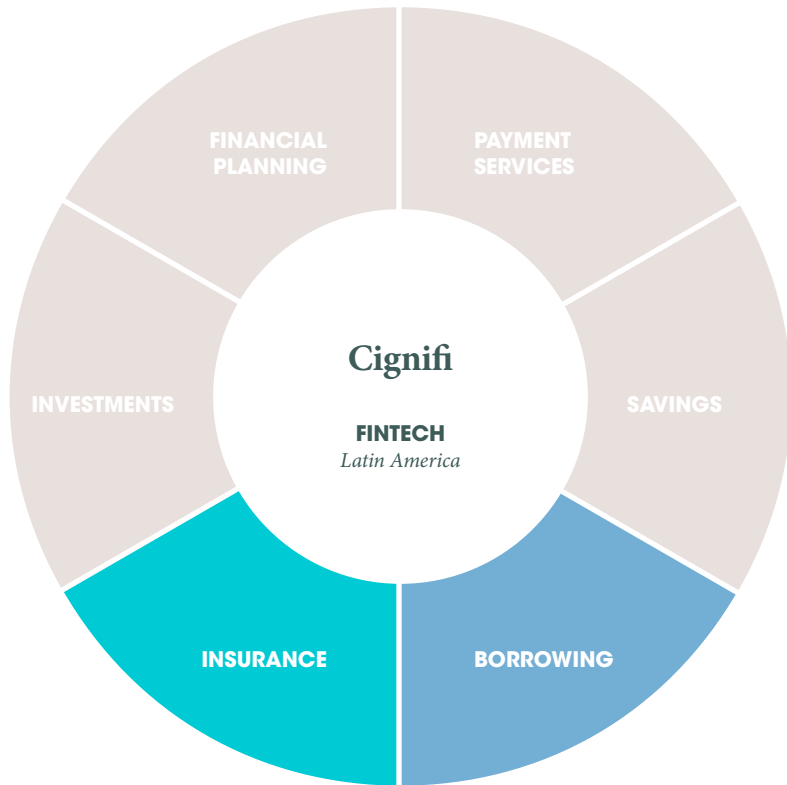
InsureTech mobile platform solution

- Enters markets, designs products, approaches underwriters and controls all aspects of the customer journey.
- Pre-paid life, personal accident, and hospitalization insurance (3, 6, 12 mo)
- In some markets, also offers pre-paid tele-doctor services

	INTERNAL DATA	EXTERNAL DATA
Individuals' financial services use	Previous use of financial services (insurance)	Analysis of mobile money use conducted by MNO analyst
Individuals' digital interactions		Analysis of mobile use conducted by MNO analyst
Other individual data		MM Customer Information (name, phone number)
		GSM Customer Information
Marketwide data		



Credit risk and marketing scores using mobile phone data.
Unlocks leads for credit/loans, insurance, savings among mobile prepaid customers.

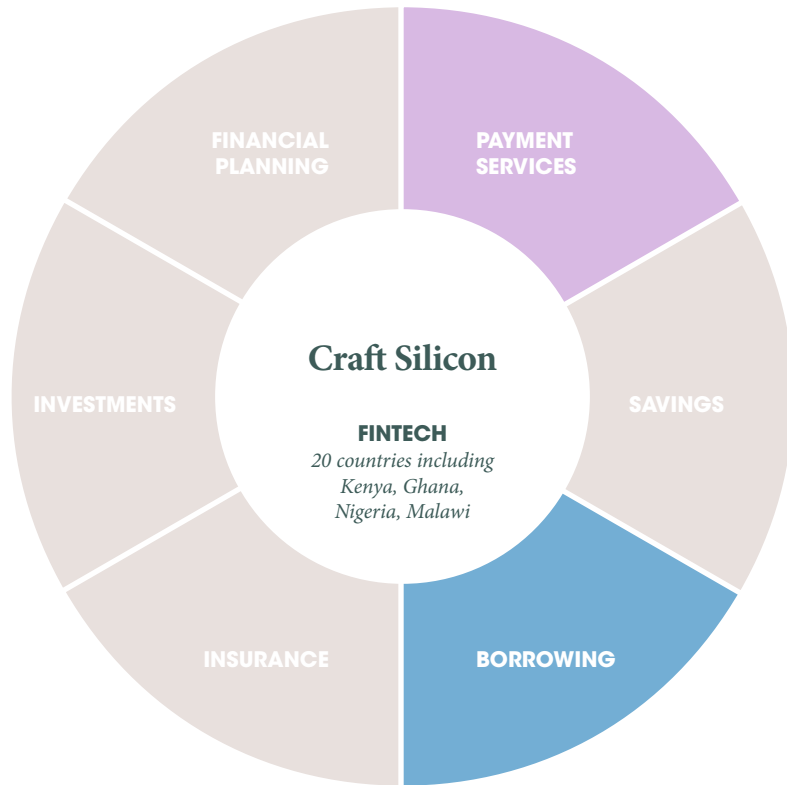


Business orientation: B2B

Credit rating for thin file customers
+ 'big data' tools

	INTERNAL DATA	EXTERNAL DATA
Individuals' financial services use	Algorithm-derived credit score (asset product)	
Individuals' digital interactions		Mobile behavior data (mobile phone use and call records)
Other individual data		
Marketwide data		

Customized software for financial services sector in Kenya and internationally. Switch and platform core financial solutions.



Business orientation: B2B

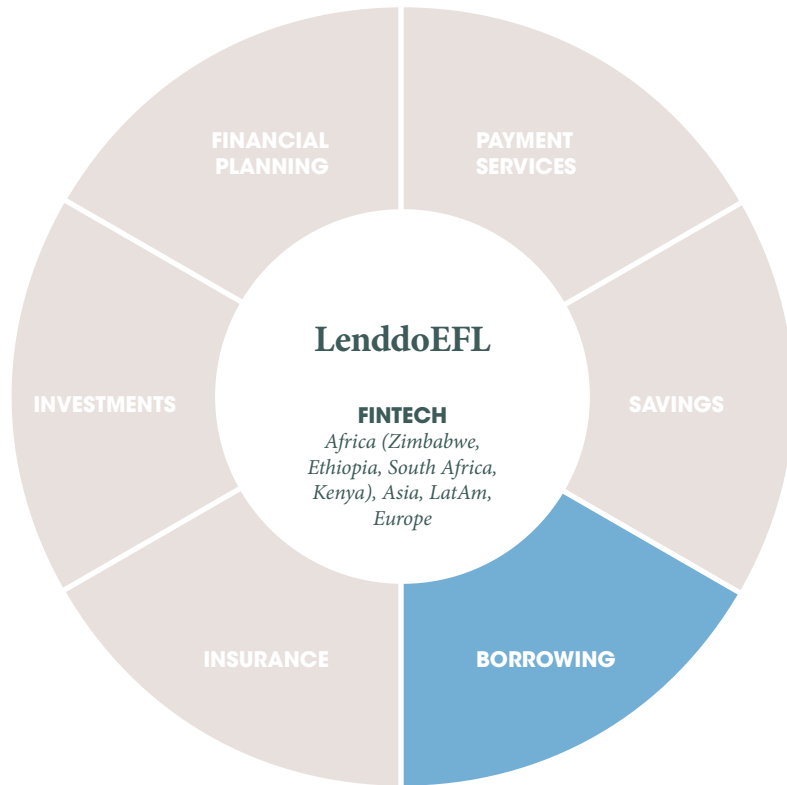
White label financial services software

Recently launched transportation services platform providing ride matching and financial services

	INTERNAL DATA	EXTERNAL DATA
Individuals' financial services use	Analysis of customer data to create credit score for clients (asset product)	Bank & MFI internal data (owned by client) Credit Reference Bureaus Utility payment data School fee payment data
Individuals' digital interactions		<i>Future—</i> smartphone usage, including social media
Other individual data		KRA (Revenue Authority), IPRS (Population registration)
Marketwide data		



Pioneer in leveraging psychometric, behavioral and digital data for credit scoring and verification in business and consumer lending



Business orientation: B2B

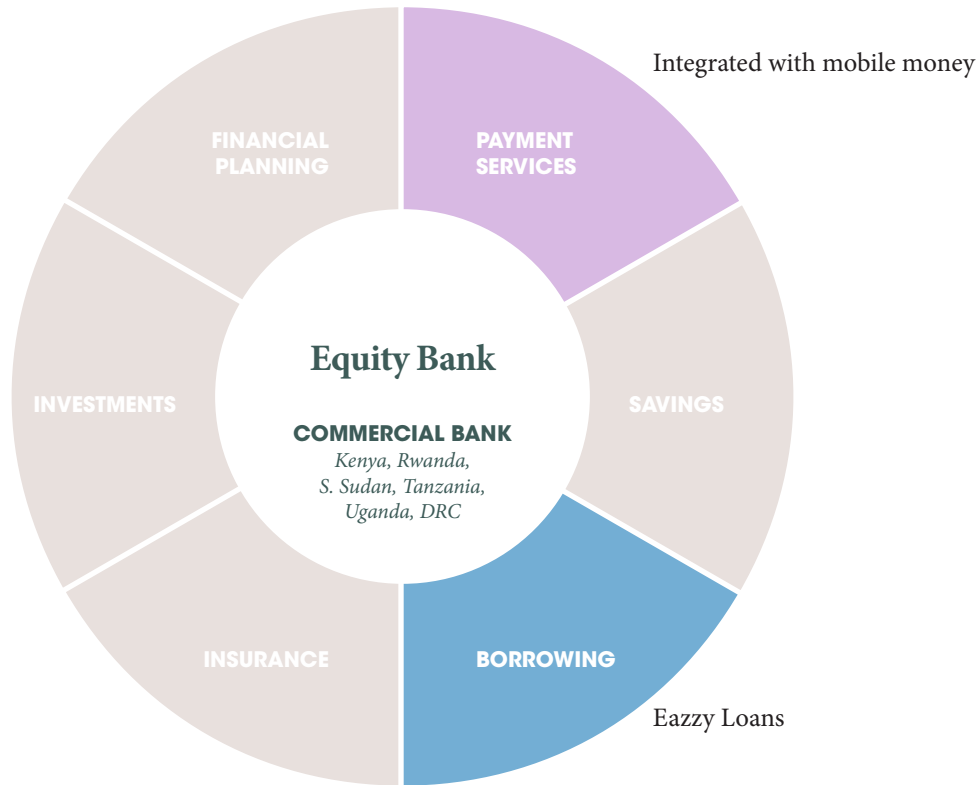
Alternative data-based credit scoring and verification platform for underbanked small business owners and consumers leveraging psychometric, behavioral and digital data

- Proprietary assessments to evaluate creditworthiness of applicants using personality and digital footprint data in order to support lending for working capital, unsecured loans, asset finance

	INTERNAL DATA	EXTERNAL DATA
Individuals' financial services use	Psychometric credit score (asset product)	Credit bureau data
Individuals' digital interactions		Mobile phone use and call records Digital footprint data Geographic location
Other individual data	Psychometric and Behavioral data, using questions and exercises addressing dimensions like honesty, diligence, confidence, and stability	These sources aren't used directly in the scoring product, but are additional layers that can be combined with psychometrics to develop a more comprehensive picture of risk.
Marketwide data		



Commercial bank HQ in Kenya that targets low-income market. Recently launched Equitel VMNO, integrating mobile & financial VAS.



Business orientation: B2C

Emergency loans thru mobile channel

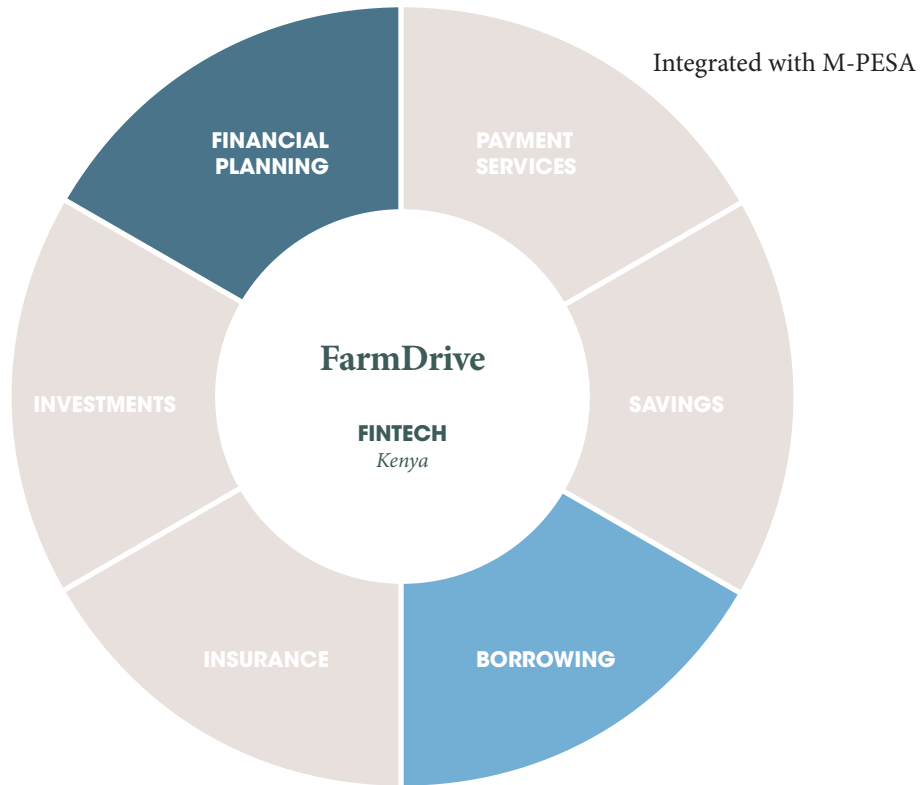
- Initial credit limit determined by behavior on Equity bank account and mobile money usage
- Various parameters that are used include: frequency of customer banking in a mo., average amount in account, default history, CRB rating etc.
- Limit based on aggregate score across all dimensions
- If the score is too low the customer will be declined

	INTERNAL DATA	EXTERNAL DATA
Individuals' financial services use	Savings account and current account info	Credit information bureaus
	Previous use of credit	Mobile money usage (<i>future</i>)
	Mobile Money usage (cash in/cash out, transactions)	Other Bank Transaction Data (<i>future</i>)
Individuals' digital interactions	Customer Agent Transactions	Mobile Airtime Top Up (<i>future</i>)
	Merchant Transactions	Mobile CDRs (<i>future</i>)
		Social Media (<i>future</i>)
Other individual data		These sources will be available in the future via Equity Bank's forthcoming Fintech application
Marketwide data		Psychometric credit scores



FarmDrive

Alternative credit scoring for Smallholder Farmers, using mobile phones, alt-data and machine learning.



Business orientation: B2C

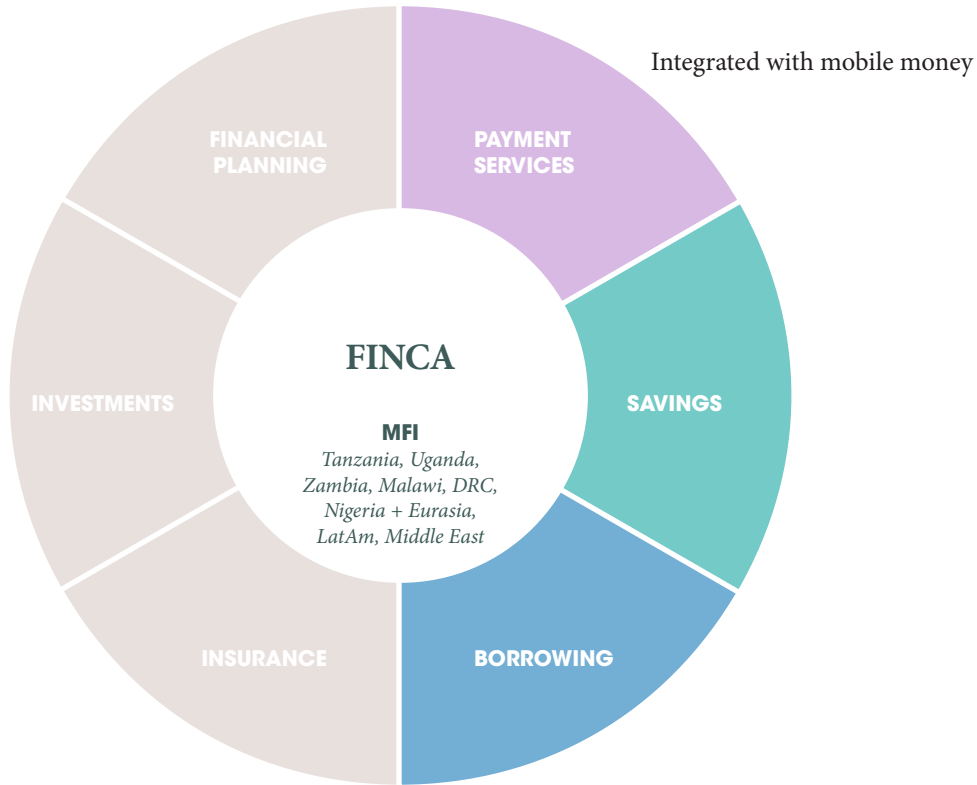
Credit rating to enable lending for small holder farmers

- Platform connects different types of alternative data, combined with big data sets
- Currently B2C, will eventually move B2B once algorithms are proven

	INTERNAL DATA	EXTERNAL DATA
Individuals' financial services use	<ul style="list-style-type: none"> Loan Repayments FarmDrive Record Keeping Service (expenses & revenues) 	<ul style="list-style-type: none"> Credit Reference Bureaus
Individuals' digital interactions		
Other individual data	<ul style="list-style-type: none"> Farmer profile (location, crops, farm size, assets, edu level) Farmer agronomic data from record keeping tool Psychometric Data KYC (name, ID) 	<ul style="list-style-type: none"> IPRS government database (for KYC)
Marketwide data		<ul style="list-style-type: none"> Weather, climate and environmental records Satellite imagery (R&D phase with CGAP) Historical Market & Income data



Microfinance organization with subsidiaries.
Information on profile pertains to Tanzania.



Business orientation: B2C (lending to Enterprises and Individuals)

Individual micro- savings and loan products through mobile channels as well as individual/group entrepreneur/business loans

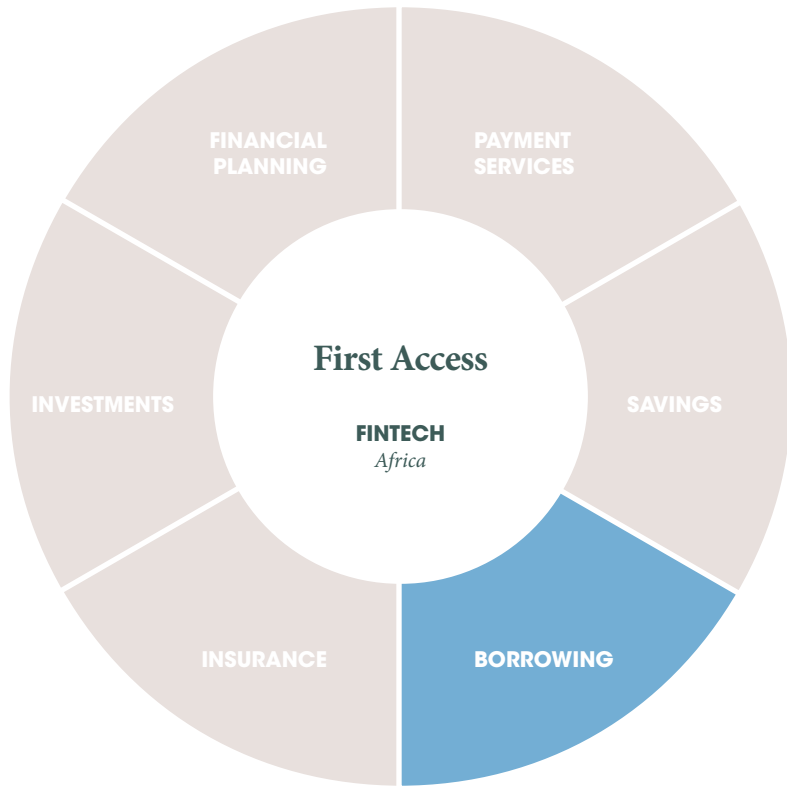
- Traditional underwriting for Enterprise; outsourcing credit scoring function for Enterprise scoring with FinTech
- Mobile financial services in partnership with MNO, leveraging mobile wallet and GSM data; Outsourcing scoring with FinTech

	INTERNAL DATA	EXTERNAL DATA
Individuals' financial services use	Use of financial services in core banking system ¹ (savings, borrowing)	Mobile money savings product usage ² Credit reference bureaus ¹ Credit score from Enterprise Data ¹
Individuals' digital interactions		Credit score from MNO data ² Social media ¹ (future)
Other individual data	HH information ¹ Geolocation ¹	New National ID system in TZ ¹
Marketwide data		

¹ Enterprise
² Mobile Financial Services



Digitization, analytics, risk management, and credit scoring for lenders in emerging markets.



Business orientation: B2B

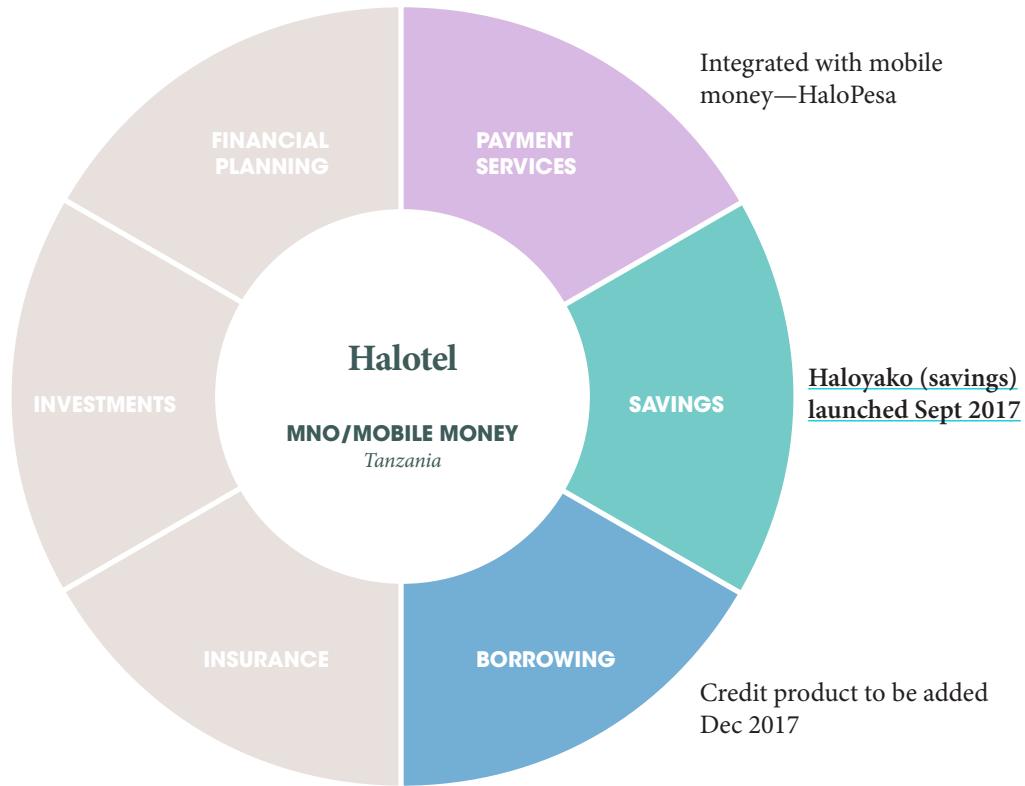
Customer acquisition platform providing analytics, risk management, and credit scoring for lenders in emerging markets

- Platform for digitizing loan appraisal and application
- Business intelligence reporting and alerts to monitor trends, increase efficiency, and lower operational costs

	INTERNAL DATA	EXTERNAL DATA
Individuals' financial services use	<ul style="list-style-type: none"> Credit score based on algorithm (asset product) Data digitization platform (asset product) API for integrating with other data sources (asset product) 	<ul style="list-style-type: none"> Mobile money (balance/transactions) Credit reference bureau data
Individuals' digital interactions		<ul style="list-style-type: none"> Mobile airtime (top-ups / balance) These sources will be available in the future via Equity Bank's forthcoming Fintech application
Other individual data	<ul style="list-style-type: none"> Applicant information acquired via loan appraisal and application Geographic location (urban/rural, mobility) Demographic (age, gender) 	
Marketwide data		<ul style="list-style-type: none"> Future version will incorporate agricultural data (Mastercard Foundation-funded project)



TZ mobile network operator, 8% marketshare (Q4, 2016).
 Parent company is Viettel Group (state-owned investment group HQ in Vietnam)



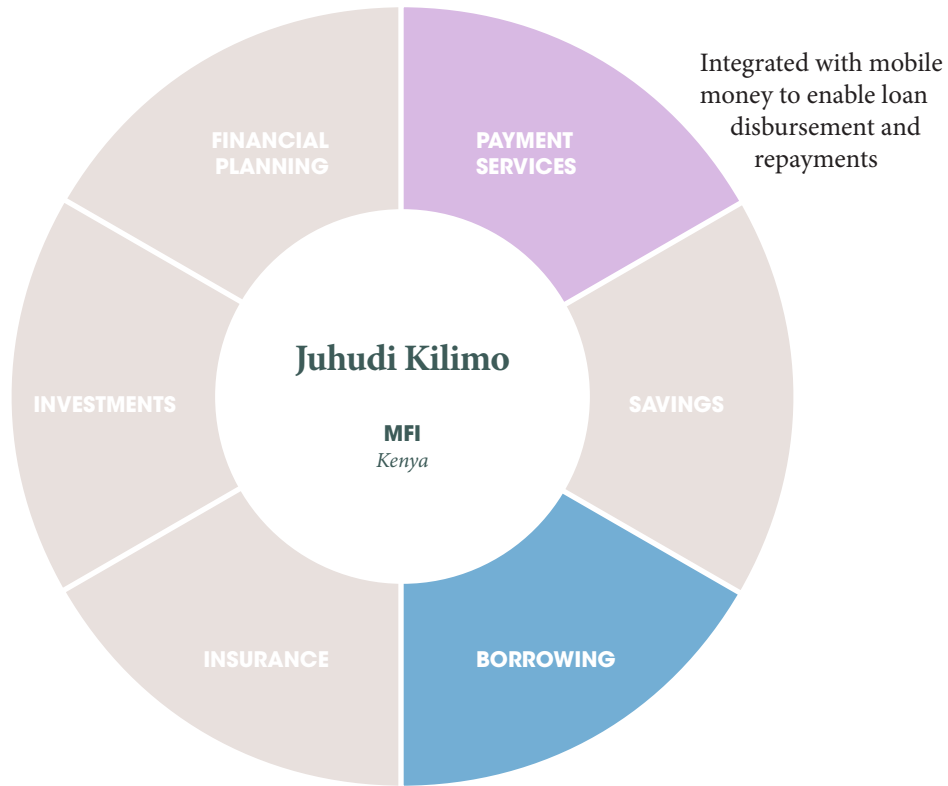
Business orientation: B2C

Micro- savings and credit through mobile channel

- Savings for general and specific goals
- Outsourced credit scoring based on mobile money and mobile phone usage

	INTERNAL DATA	EXTERNAL DATA
Individuals' financial services use	Halopesa usage (transactions, CICO) and balance	Credit scoring provided by 3rd party
	Use of financial services (Haloyako savings)	
Individuals' digital interactions	Mobile phone use and call records	Credit scoring provided by 3rd party
	Halotel GSM balance	
Other individual data	KYC information	
Marketwide data		

MFI financing specific agricultural assets that offer immediate and sustainable income for farmers.



Business orientation: B2C

Asset financing and P2P lending guarantees for smallholder farmers

- Lending for farm animals, equipment, working capital, clean energy
- Psychometric score pilot funded by MCF

	INTERNAL DATA	EXTERNAL DATA
Individuals' financial services use		Credit Reference Bureaus
Individuals' digital interactions		
Other individual data	Household and agronomic information (via loan officer)	Psychometric credit score (via <u>EFL</u>)
Marketwide data		



Creating financial identities for thin file MSMEs using behavioral data from mobile usage



Business orientation: B2B

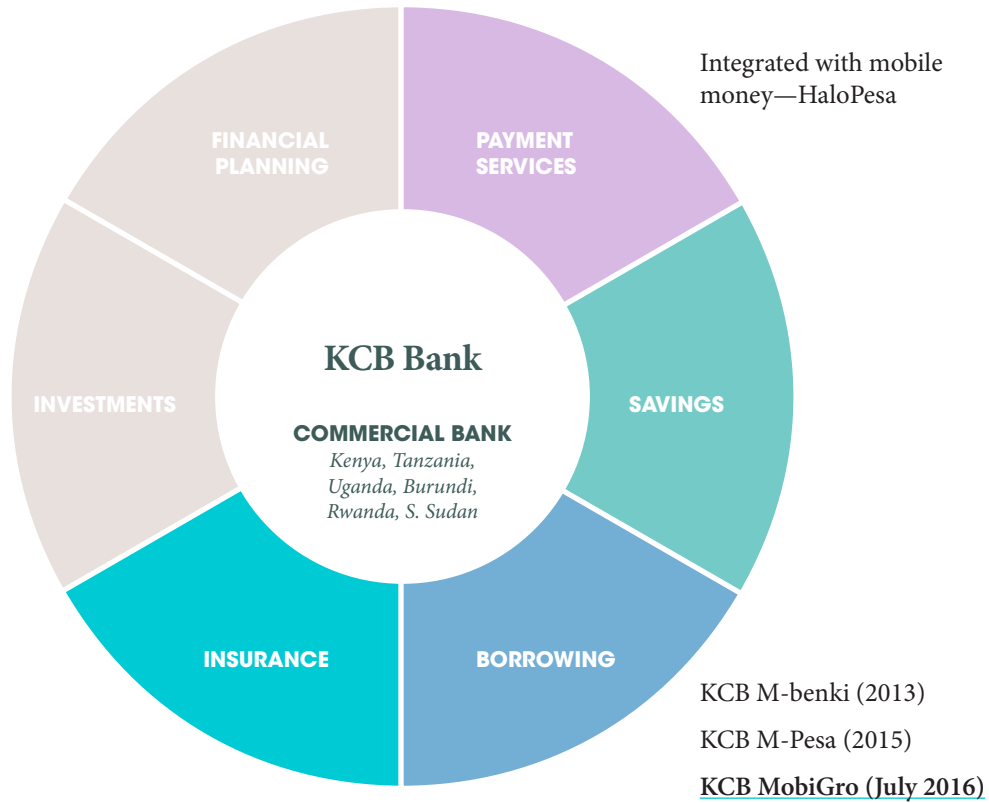
Transactional platform with predictive analytics and machine learning capabilities for MSME savings, lending and insurance products offered thru mobile channels

- Leveraging customer GSM & mobile money behavior to assess creditworthiness (*see video*)
- Starting to launch savings products that have an insurance wrapper

	INTERNAL DATA	EXTERNAL DATA
Individuals' financial services use	Algorithm-derived credit score (asset product)	Anonymized mobile wallet behavior
Individuals' digital interactions	USSD Interactions	Anonymized GSM usage (voice, SMS, data)
	CI Surveys	Geographic location (nearest tower)
Other individual data		Customer Days Active on Network
Marketwide data		



Largest commercial bank in Kenya, part of KCB group.
Information on profile pertains to Kenya.



Business orientation: B2C

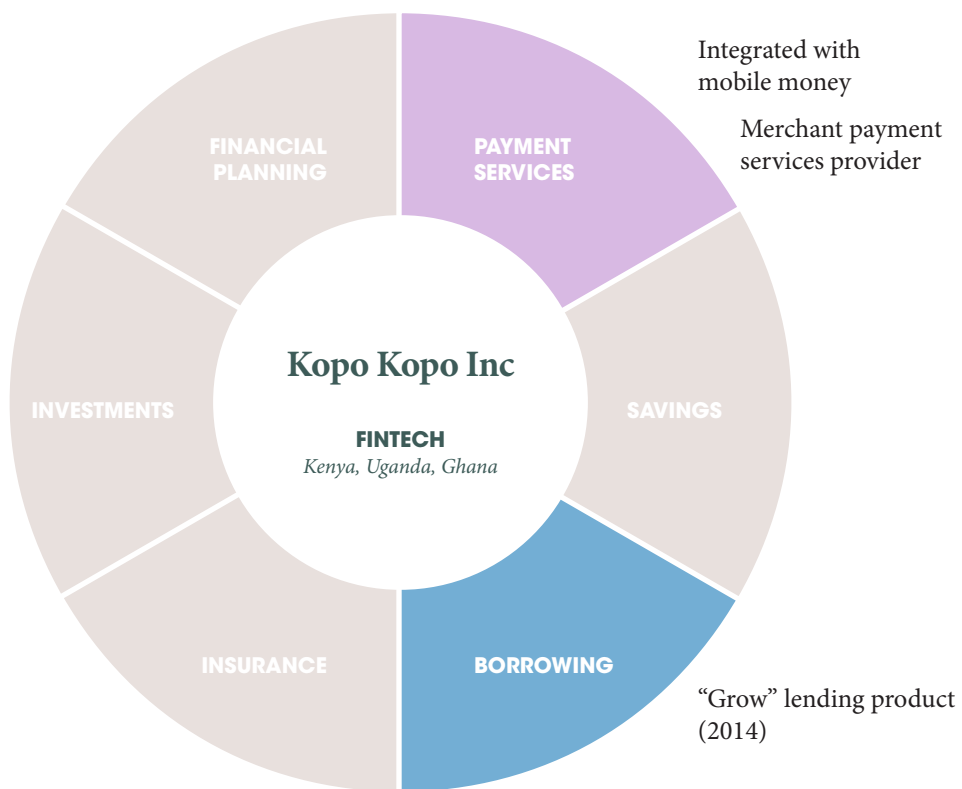
Bundled products including micro-savings and credit, insurance, and other value added services through mobile channel

- KCB M-benki – micro- savings and credit
- KCB MobiGro – bundled product for farmers—insurance, credit, savings, training on farming skills, links to input providers and markets
- KCB M-Pesa – micro- savings and credit

	INTERNAL DATA	EXTERNAL DATA
Individuals' financial services use	<ul style="list-style-type: none"> KCB conventional banking platform KCB mobile banking platform Bill Payments (from KCB utility payment services) 	<ul style="list-style-type: none"> Mobile money use and behaviour (KCB M-PESA) Credit reference bureaus Data from off-takers, food producers / farmer organizations, contract farming, agri-NGOs, and other agri-business deals
Individuals' digital interactions		<ul style="list-style-type: none"> Mobile phone usage and behaviour
Other individual data		
Marketwide data		<ul style="list-style-type: none"> Considering satellite data (<i>future</i>)



Market-appropriate solutions for SMEs enabling them to go digital and use mobile payments.



Business orientation: B2C (customers are merchants)

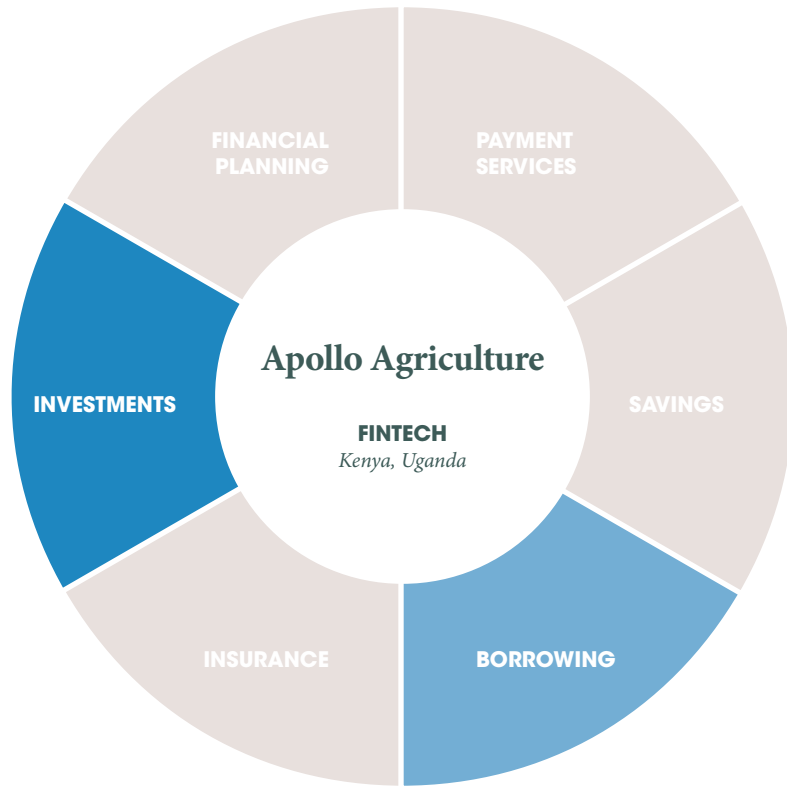
- \$150 – \$50,000 loans for merchants with credit worthiness assessment based on transactions data

Lending for SME merchants leveraging merchant transaction data

	INTERNAL DATA	EXTERNAL DATA
Individuals' financial services use	Merchant transactions through platform (Lipa Na M-Pesa or MasterPass QR)	Credit Reference Bureau (final check, not part of algorithm)
Individuals' digital interactions		
Other individual data	Merchant KYC (ID, business information)	
Marketwide data		



Turnkey solution for financing alternative lenders (technology and service connecting them to sources of capital in US/UK)



Business orientation: B2B

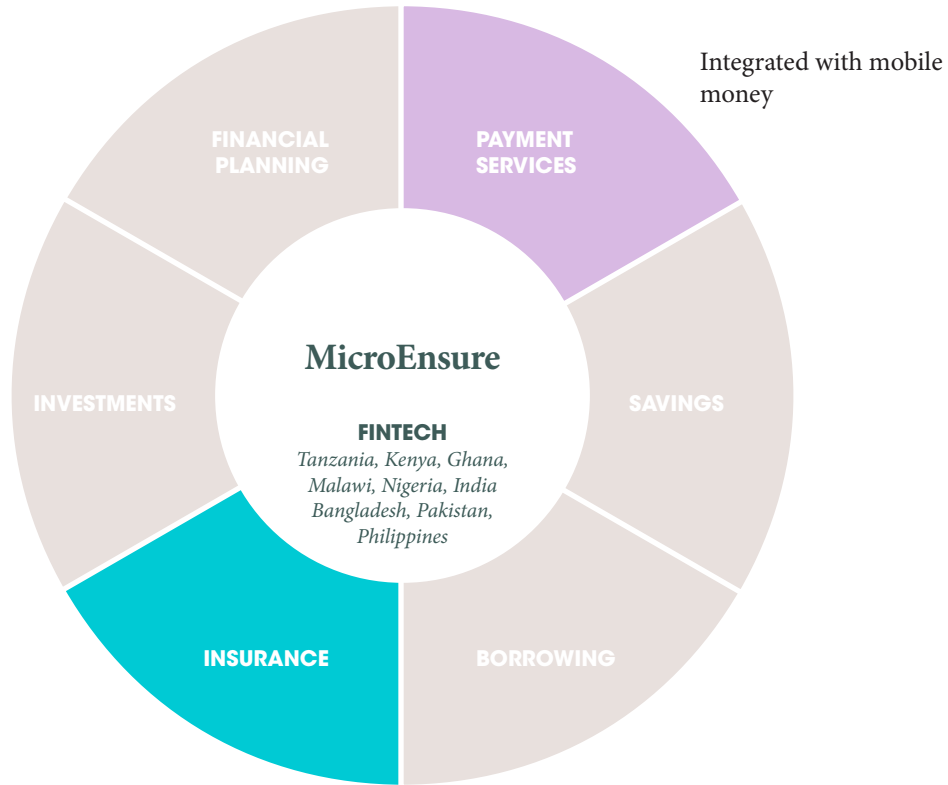
Solution for alternative lenders including analytics (through business intelligence platform and data scientists) and connection to sources of capital

- Analytics offered to lenders as well as investors
- Portfolio risk based on individual responses to situations, especially correlated events (election, drought, etc.)

	INTERNAL DATA	EXTERNAL DATA
Individuals' financial services use	<p>Lendable Risk Engine: automated bayesian cash flow simulations and individual scoring (asset product)</p> <p>Lendable proprietary database of benchmarks</p>	<p>Partner customer data</p> <p>Reconciliation with payments gateways</p>
Individuals' digital interactions		
Other individual data		
Marketwide data		<p>Macro data sets on financial shocks</p>



Specialist provider of life, health and property insurance to mass market via mobile financial services, MNOs, MFIs, banks and co-ops.



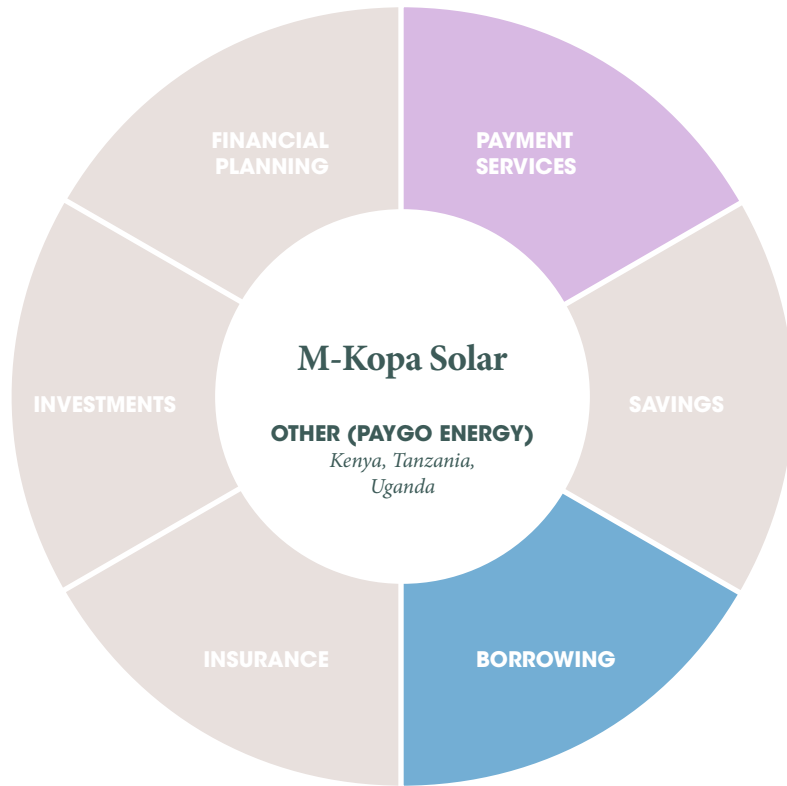
Business orientation: B2B
 InsureTech mobile platform solution

- Back office insurance industry support, including product design, high-volume administration and claims servicing

	INTERNAL DATA	EXTERNAL DATA
Individuals' financial services use	Insurance purchases	Loan balances
	Insurance payment history	Savings balances
	Insurance renewals	Mobile money balances
	Insurance claims	
Individuals' digital interactions	Digital customer service interactions	Snapshot of airtime balance (from a few providers)
Other individual data	In-person customer service interactions	Geolocation (manual, from MFI partners)
Marketwide data	Risk and incident rate across emerging markets portfolio	Weather records



Solar energy company providing home-based systems, with the availability of add-on products, on a PAYGO basis.



Business orientation: B2C

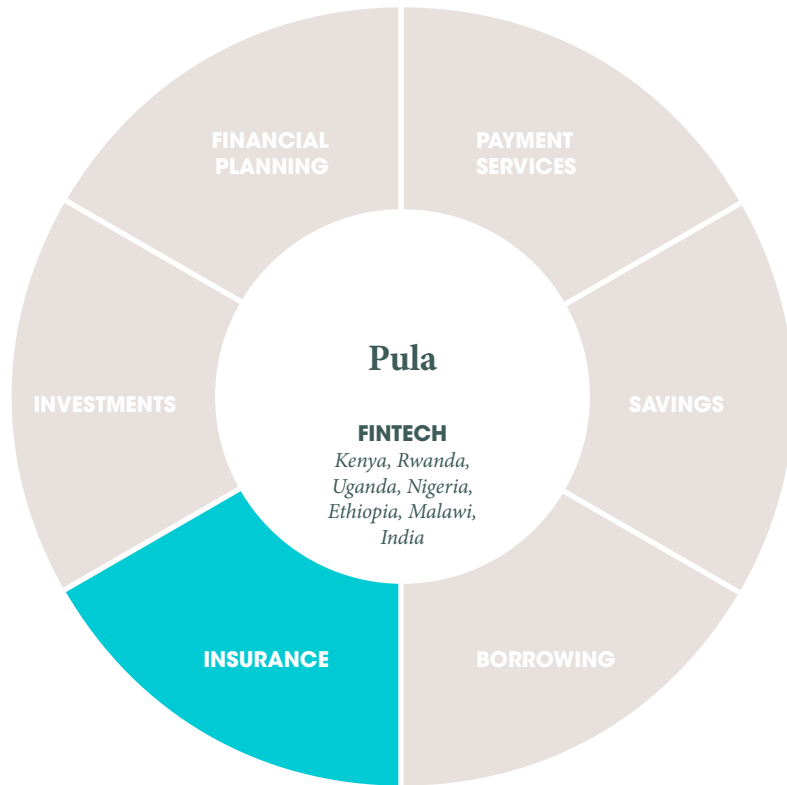
Asset financing based on solar home energy systems

- Data and analytics are used operationally to track customers and inform customer acquisition / distribution network
- Data and analytics also used in new product development and pricing

	INTERNAL DATA	EXTERNAL DATA
Individuals' financial services use	Amount on deposit / downpayment	Credit Reference Bureau (for KYC)
	PAYG payments histories / equity in the device	M-Pesa transaction history (aggregated, & only with consent)
Individuals' digital interactions	Use of the device	
	Geographic location of the device (for cohort performance)	
Other individual data	Basic KYC	M-Pesa database (name match only for KYC)
Marketwide data		HH surveys, financial diaries, surveys, HCD teams, etc.



Radically restructuring agriculture insurance, using technology to insure previously unbanked, uninsured, untapped markets



Business orientation: B2B

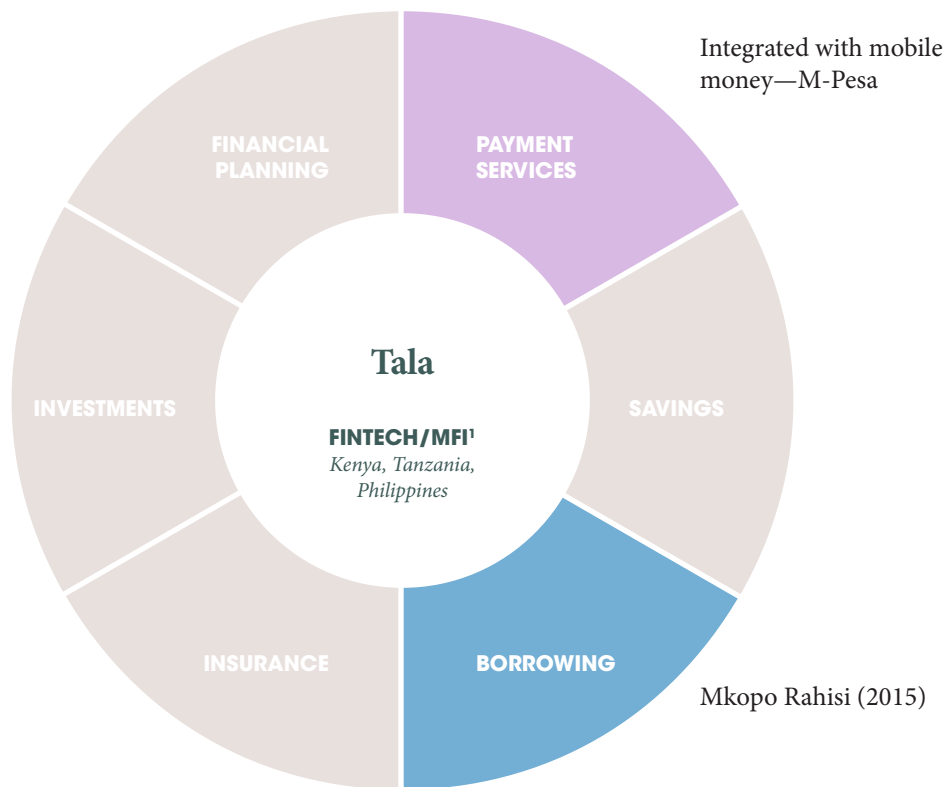
Platform for integrating area yield insurance into farming products

- Insurance embedded into farming product, avoiding the need to put insurance education at the center of the product. (See Ted Talk [video](#))
- Periodic farming tips, based on date and crop planted

	INTERNAL DATA	EXTERNAL DATA
Individuals' financial services use		
Individuals' digital interactions		
Other individual data	<ul style="list-style-type: none"> Agronomic data based on item insuring and date registering KCB conventional banking platform 	
Marketwide data		<ul style="list-style-type: none"> Satellite imagery and precipitation data Agricultural yields and irrigation information



Alt-data credit scoring and platform for providing instant credit.



Business orientation: B2C

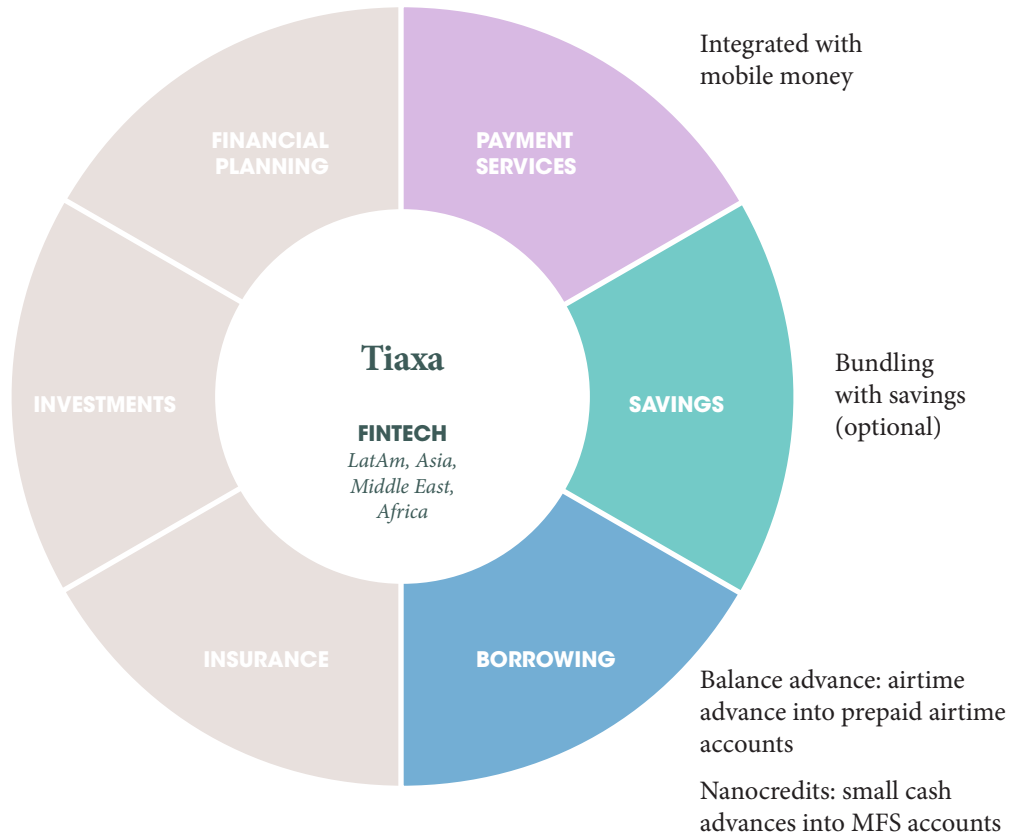
On-balance sheet lending based on alternative-data credit scoring

- Individual and microbusiness finance
- Smartphone application scans loan applicant's data and assesses creditworthiness near-instantly

	INTERNAL DATA	EXTERNAL DATA
Individuals' financial services use		
Individuals' digital interactions	SMS (sniff for financial transactions)	
	CDRs	
	Apps on phone	
	Social media usage	
Other individual data	Geographic location	
	Self-reported data on identity, income and motivation for loan	KYC verification (IPRS in KE; MM provider cross-check in TZ)
Marketwide data	User research findings for product improvement	



Global Leader in Nano-Credits, providing 10 million small loans per day in over 20 countries, both as airtime for prepaid mobile phone subscribers and as cash through Mobile Money, for unbanked people in emerging markets.

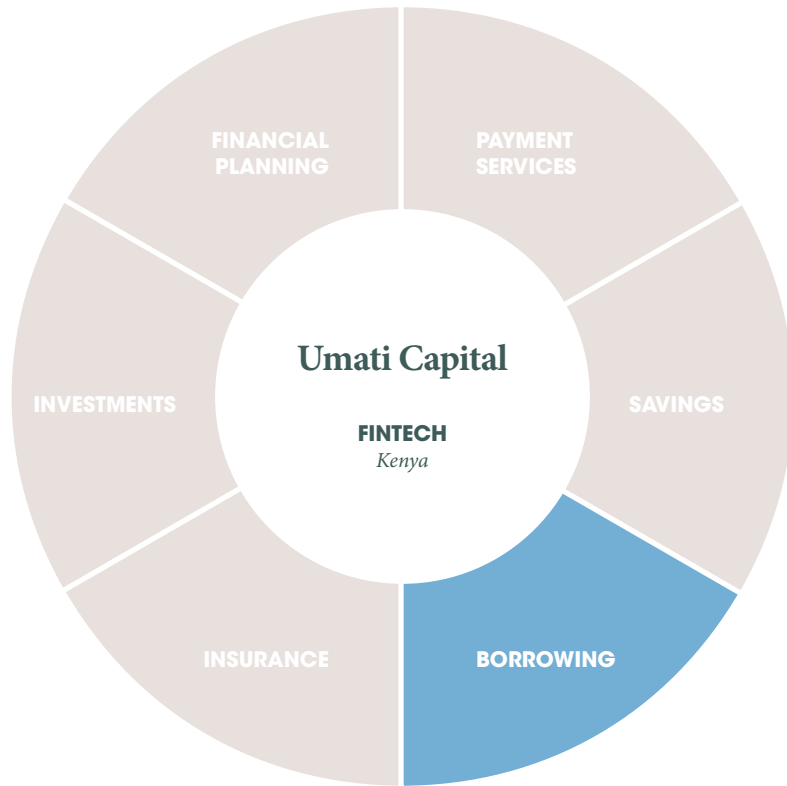


Business orientation: B2B

Turn-key solution for MNOs to expand into digital lending

- On-balance sheet nano-lending in mobile money or airtime
- Credit scoring based on mobile money and mobile phone usage patterns

	INTERNAL DATA	EXTERNAL DATA
Individuals' financial services use	History of use with nano-lending products	Mobile money behaviour (cash in / cash out, transactions)
Individuals' digital interactions		Mobile phone use and call records
		Top up and recharge behavior
Other individual data		KYC information (name, DOB, etc.)
Marketwide data		



Business orientation: B2C

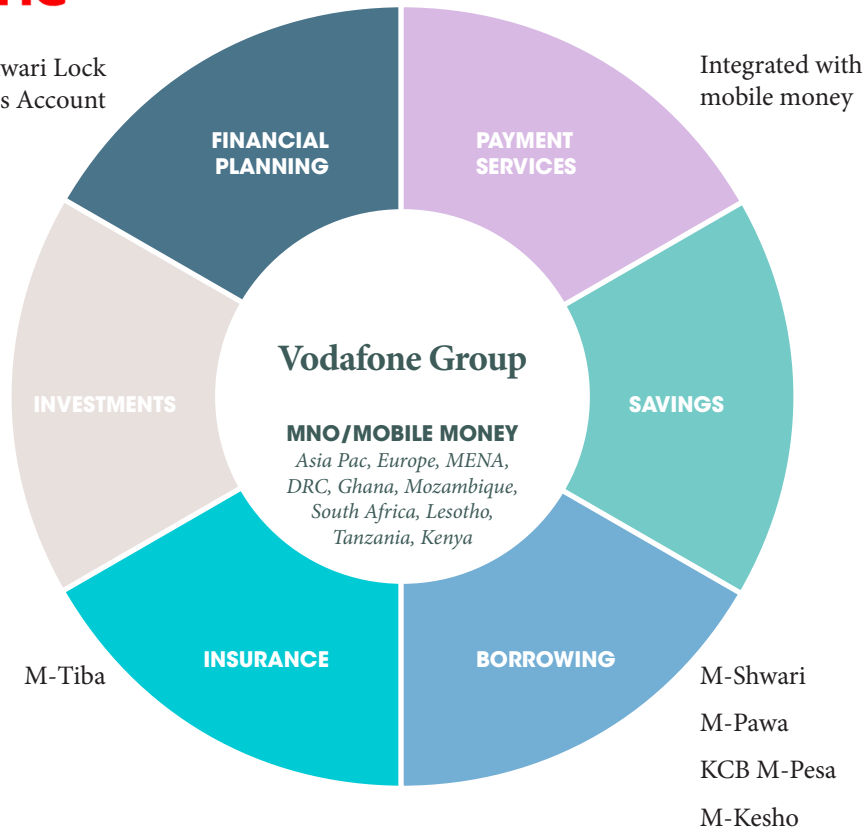
On-balance sheet invoice discounting / factoring based on traditional and alternative-data underwriting

- Currently credit scoring is on off-taker (against receivables and CRB data)
- Recently now also screening suppliers (bank statements and sales history) and looking to add additional alternative data into algorithm for screening suppliers

	INTERNAL DATA	EXTERNAL DATA
Individuals' financial services use	<ul style="list-style-type: none"> Sales history (suppliers) Bank statement analysis (suppliers) Receivables (off-taker) 	<ul style="list-style-type: none"> Credit Reference Bureaus (suppliers) Mobile Money data (suppliers) <i>(future)</i>
Individuals' digital interactions		<ul style="list-style-type: none"> Social media (suppliers) <i>(future)</i> Psychometrics (suppliers) <i>(will outsource) (future)</i>
Other individual data		
Marketwide data		<ul style="list-style-type: none"> Commodities pricing / quantities / supply areas



Largest MNO in Tanzania and Kenya. Ranked second world wide in terms of number of connections.



Business orientation: B2C & B2B

Developing a platform for a range of players to be able to use data for credit scoring

- Products using alternative data for credit scoring in Kenya and Tanzania:
 - **M-Shwari** (KE)—savings / micro-credit product
 - **M-Pawa** (TZ)—savings / micro-loan product
 - **KCB M-Pesa** (KE) —KCB products on M-Pesa rails
 - **M-Kesho** (KE)—Equity bank products on M-Pesa rails
 - **M-Tiba** (KE)—mobile health wallet

	INTERNAL DATA	EXTERNAL DATA
Individuals' financial services use	Credit Score (asset product based on mobile money and mobile phone behaviour) M-Pesa Behavior	
Individuals' digital interactions	GSM Behavior and CDRs	
Other individual data	Demographic data	
Marketwide data		



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