

Is blockchain the missing piece to financial inclusion?



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in collaboration with



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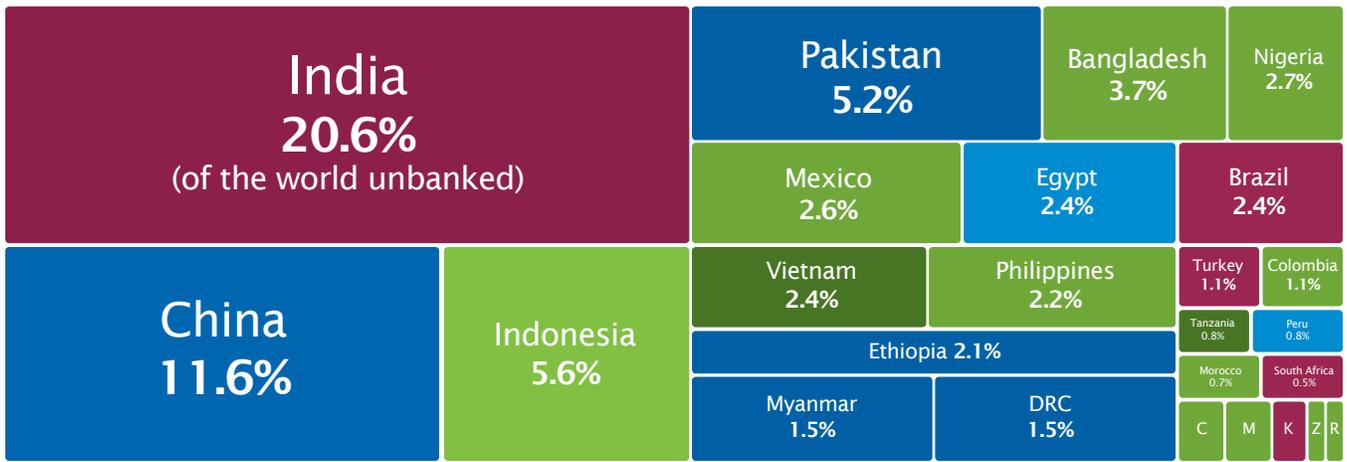
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1. The financial inclusion business model

The World Bank estimates that over two billion adults worldwide don't have a basic bank account⁽¹⁾, excluding them from the financial tools they need to facilitate in everyday life, to guard against risk, and to invest in their futures. Microfinance institutions (MFIs) in the frontier markets of Africa, Asia and Latin America play an invaluable role in driving financial inclusion among this unbanked and underbanked population.

Though their business model has proven to be sustainable and effective in promoting financial inclusion, MFIs face a range of challenges around customer identification, technology infrastructure, fraud and operating costs. This paper considers the potential role of blockchain in addressing these challenges, as well as the barriers to widespread adoption of blockchain among frontier market MFIs.

Unbanked population in 25 countries, predominantly in Asia and Africa



International Development Association (IDA) countries

● % Access ● 0-25% ● 26-50% ● 51-100%

C: Cote d'Ivoire 0.4% M: Mozambique 0.4%
K: Kenya 0.3% Z: Zambia 0.2% R: Rwanda 0.2%

Source: World Bank Group

2. Operational pain points for frontier market MFIs

To gain insight into MFIs' pain points and their perceptions of the blockchain, IBS Intelligence interviewed an MFI in Asia, a European non-profit organisation that supports African MFIs, and a fintech company working with frontier market MFIs. Some of the key MFI challenges we identified through these interviews and our desk research are as follows:

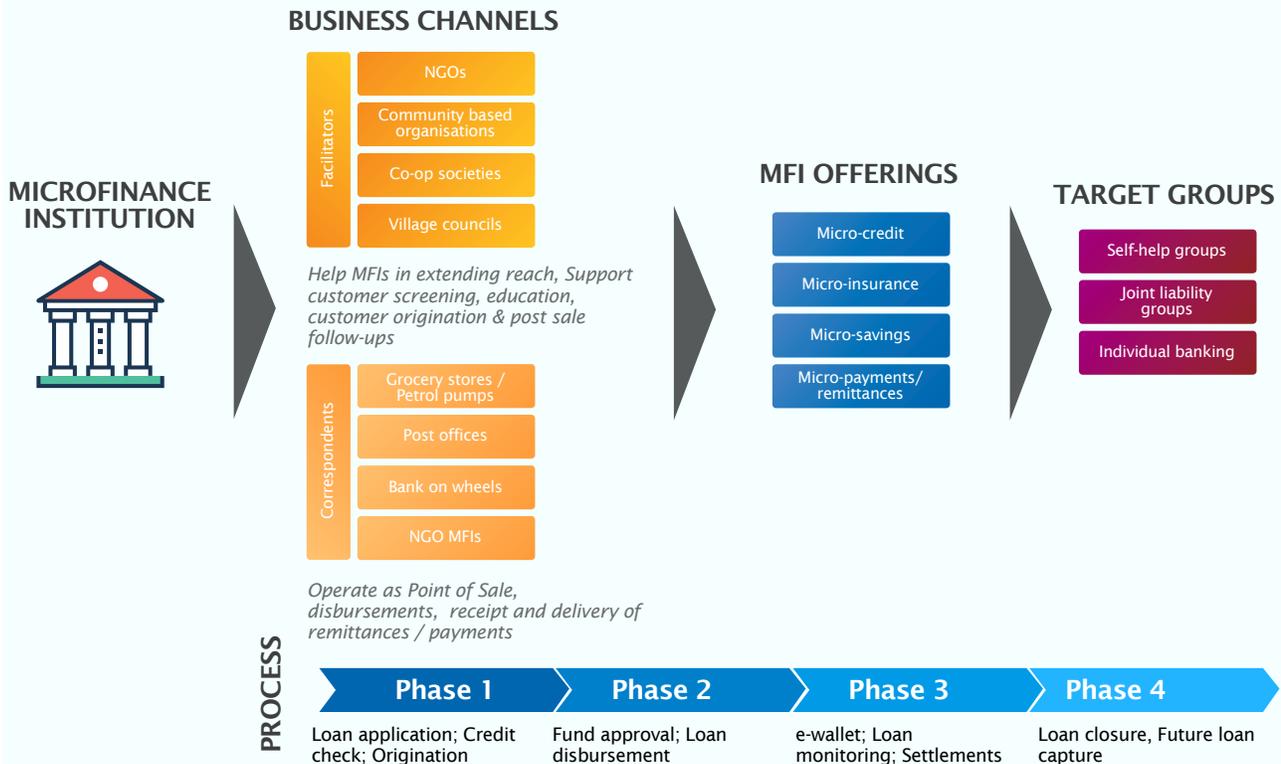
Issues in client capture:

- Lack of legal status and identity management structure
- Limited collateral offered as guarantee and issues in legal documents attached to the collateral
- Improper customer on-boarding techniques i.e. Know Your Customer
- Lack of knowledge about MFI services

1. "Financial Inclusion Overview", World Bank, retrieved April 1 2018.
<http://www.worldbank.org/en/topic/financialinclusion/overview>

Is blockchain the missing piece to financial inclusion?

Current model for MFIs to solve financial inclusion



Source: IBS Intelligence

Operational inefficiencies

- Manual data capture by field officers during client meetings
- High rates of fraud and human error in business processes
- Lag between collecting loan repayments and calculating Portfolio at Risk (PAR)
- Lack of real-time reporting across branches

Technology limitations

- Legacy core banking systems, or even a complete absence of automated systems
- High cost of growing branch networks due to purchasing and implementing on-premise systems
- Lack of technical skills to keep up to date with evolution of technology

Blockchain is one of the emerging technologies that may—in the long term—help to address some of these challenges.

3. Decoding blockchain

Best known as the technology powering cryptocurrencies such as bitcoin, the blockchain is a decentralised ledger that is used to securely store data, transactions and contracts. Its characteristics are as follows:

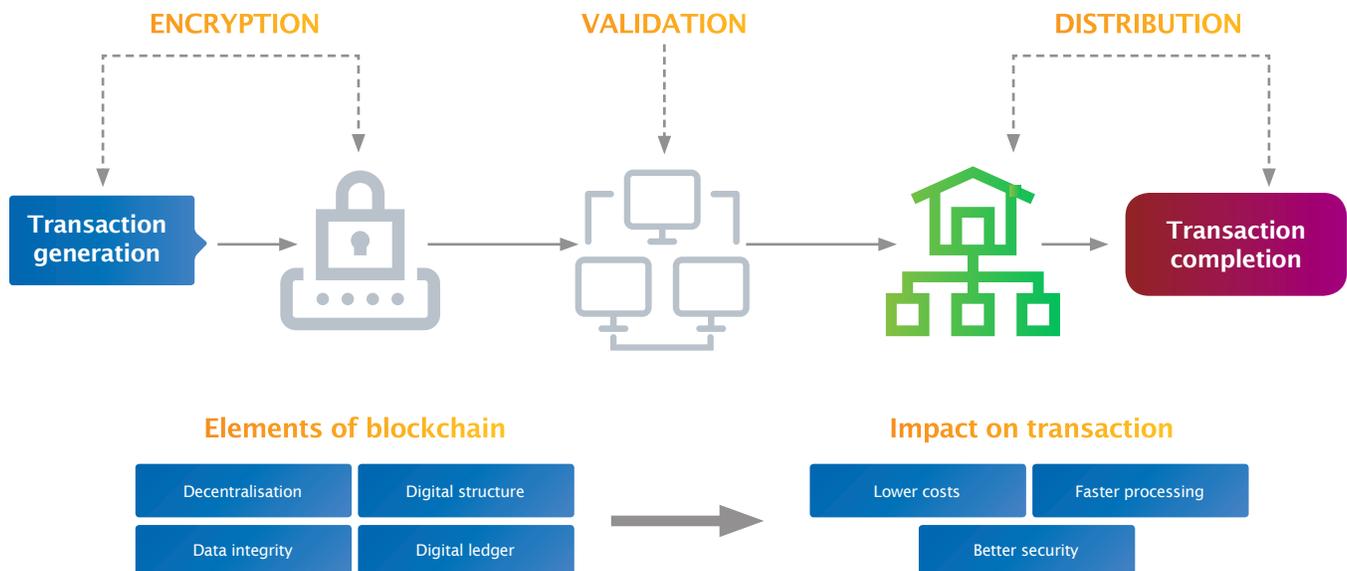


It is shared across multiple computers and updated in real time. Think of the blockchain as a digital ledger shared between multiple people and companies across numerous Internet-connected computers. When two parties complete a transaction—for example, Bob agrees to give a bitcoin to Alice—everyone’s copy of the ledger is automatically updated in real-time to show that Alice is the owner of a bitcoin, acquired from Bob.

It provides a complete, time-stamped and unalterable record of transactions. Once a transaction is completed, there will always be a permanent, timestamped record in the ledger. If Bob changes his mind, he cannot simply delete the record. He also can’t reverse the transaction, without Alice agreeing to send the bitcoin back to him in a new transaction.

It uses cryptography to ensure the security and integrity of transactions. Cryptography is about using mathematics to encrypt and decrypt data, so that only the intended recipient can read it. When Bob is sending a bitcoin to Alice, he will use his private key—a long string of numbers and letters—to authenticate (or ‘sign’) the transaction. He will send the bitcoin to Alice’s public key, a shorter string of numbers derived from her private key. Blockchain uses a complicated mathematical algorithm to generate the public keys, meaning that it is practically impossible to work out a private key from the public key.

In a **public blockchain**, such as Bitcoin, anyone may take part in the network and maintain the shared ledger. All transactions added to the blockchain are public, so anyone can see them. That means it’s difficult for Bob to dispute that he gave a Bitcoin to Jane—the evidence is there for anyone to see on the public ledger.



Private permissioned blockchains allow a single party or a consortium to set the participation rules and restrictions for the blockchain. Participants need permission to join. This model is likely to be more appealing than a public blockchain network for financial institutions like banks and MFIs—it provides for a higher level of data and transaction privacy.

4. The benefits of blockchain

Blockchain's inherent advantages may help address some of the key challenges that MFIs face as they seek to drive financial inclusion and enhance operational efficiencies. However, the financial inclusion and microfinance sector faces considerable challenges in implementing the technology on a large scale and in transitioning from an analogue or legacy world to a world of digital trust.

Trust by design

Blockchain provides a way for participants in a business network to continuously store, amend and share verified data in a transparent manner. More than one party needs to verify each set of transactions before a block can be added to the chain. Thus, participants in the blockchain can put their trust in the verification process, even if they do not know each other.

Auditability

The blockchain provides a traceable, timestamped trail of transactions between the participants in the chain that cannot be deleted or changed. This feature of blockchain could especially be useful in the MFI model to prevent fraudulent and duplicate transactions.

Efficiency

The decentralised nature of blockchain, with immediate validation of every transaction, allows for real-time data entry to the digital database without verification by an intermediary such as a clearing house or payments gateway. This can speed up and streamline the processing of financial transactions.

Low costs

Blockchain enables low-cost, peer-to-peer transactions, offering an alternative to expensive and potentially inflexible centralised solutions, infrastructure and authorities.

Smart contracts

'Smart contracts' extend the functionality of the blockchain by allowing transactions to be settled automatically when certain conditions are met. Rather than enforcing the terms of a legal relationship by means of the courts and the law, a smart contract uses computer code to implement the agreement. The terms will be set by the parties that control the blockchain.

As a simple example, the French insurer, AXA, is piloting insurance powered by a smart contract. When someone buys flight delay insurance, the transaction is recorded in the Ethereum blockchain. This smart contract is connected to global air traffic databases. If the flight for which the person purchased insurance is delayed by more than two hours, the system automatically pays them compensation without them needing to make a claim⁽²⁾.

2. "AXA Goes Blockchain with Fizzy," AXA, September 13, 2017.
<https://www.axa.com/en/newsroom/news/axa-goes-blockchain-with-fizzy>



I. Key application of blockchain in financial inclusion

Digital Identity management

Around 1.1 billion people around the world live without an officially recognised identity, according to the ID2020 project⁽³⁾. Blockchain technology offers a tamper-proof mechanism to create digital identities for poor citizens who lack formal identification documentation. Technology firms and governments are exploring options such as using biometrics to create such a digital identity.

One example is BanQu, an economic identity technology platform that creates a digital profile using various records of personal, financial and other activities. BanQu enables the unbanked to develop a tractable, vetted financial and personal history as they transact on the BanQu blockchain. While this platform is currently being used to create a record for refugees, financial institutions could use the platform to track unbanked and underbanked citizens⁽⁴⁾.

Alternative credit scoring

World Bank statistics show that public credit databases in many emerging market countries cover less than 10% of the population⁽⁵⁾.

If the microfinance sector in a country or region cooperated on a shared blockchain platform, it could build a decentralised alternative to the formal credit bureaus. Borrowers' transactional history could be recorded on a shared ledger, giving credit officers insight into their borrowing and repayment histories, as well as the outstanding loans in their name.

Prevention of fraud

MFIs face a constant risk of fraud and excessive borrowing by a single individual, which often results in losses and bad debts. Once all MFIs and banks are able to aggregate their customer data in a blockchain network, instances of individuals borrowing excessively from multiple lenders or multiple borrowers pledging the same collateral could be prevented.

5. Current state and outlook of blockchain application in financial inclusion

Recent proof of concept projects and small-scale applications show that blockchain has significant potential as a tool for improving financial inclusion. However, there are numerous barriers to mainstream adoption of blockchain technology.

3. "An Alliance Committed to Improving Lives through Digital Identity", ID2020, retrieved April 11 2018.
<https://id2020.org/>

4. Banqu, retrieved April 1 2018.
www.banquapp.com

5. "World Bank, Doing Business Project", World Bank, retrieved April 1, 2018.
<https://data.worldbank.org/indicator/IC.CRD.PUBL.ZS>

I. Hurdles in mainstream adoption of a blockchain network for MFIs

Current infrastructure of MFIs

MFIs in countries such as India and Bangladesh have put in place core banking and lending solutions with functionality that is comparable to mainstream banking software. However, MFIs in many parts of Africa and Asia still use spreadsheets or even pen and paper to record their transactional data. This lack of basic technology infrastructure will hold them back from adopting blockchain-based solutions, which rely on digital data as a fundamental requirement.

Interoperability

In an ideal world, blockchain technology will allow multiple users and organisations to share information and transact without any cross-border limitations. But with numerous organisations worldwide working to create their own blockchain platforms, interoperability and fragmentation may become barriers to adoption.

Privacy

Blockchain represents a potential shift away from a traditional, centralised model where users' data and transactions are stored in secure, private databases. A public blockchain or even a private blockchain serving a large community of organisations and people may bring a level of transparency to private information that some people may find uncomfortable.

Regulatory compliance

Regulators in many countries—tasked with ensuring stability and fairness in the financial system—are wary of the blockchain. There are many complex compliance issues for them to consider, including which country has jurisdiction across borders and who takes liability since as blockchains are not locked to a specific location or controlled by a single party. Since transactions are instant and cannot be modified, regulators may also be concerned about how errors or fraudulent transactions can be amended.

II. Recommendations

The blockchain could play a valuable role in the delivery of financial services to the financially excluded in the future. In the shorter term, however, the technology is not mature enough to address the challenges MFIs experience in enhancing operational efficiency, reducing bad debt and losses, making better credit decisions or cutting fraud.

In the longer term, Oradian and IBS believe blockchain will be a useful back-end technology that will help MFIs to streamline their interactions with the wider financial ecosystem. We do not envisage that it will have a direct impact in end-consumers' experience with the MFI any time soon. Based on our research, our recommendations are as follows:

For governments and regulators in frontier markets

Start putting in place legal and regulatory frameworks that encourage the financial services industry and fintech companies to experiment and innovate with blockchain.



Monitor the progress of projects such as ‘ID2020’— an alliance of UN agencies, NGOs, governments, and enterprises committed to improving lives through digital identity—and participate if appropriate. Such programmes and projects could help to address financial inclusion challenges and challenges of interoperability at great scale.

For the formal financial services industry

The mainstream deployment of this technology will depend on a concerted effort by banks, financial institutions and fintech firms. The immediately realisable benefit is the ability to create a digital identity and record customer data on a shared immutable database accessible to all regulated financial institutions and governments. Institutions should be open to working with fintech firms specialised in blockchain applications to develop solutions that benefit the entire industry.

For MFIs and rural banks in frontier markets

The priority for MFIs shouldn’t be ‘how’ and ‘when’ to use the blockchain, but to put in place technology platforms that enable them to digitise their operational data, streamline transactions and gain more visibility into customers and transactions. This will deliver dramatic improvements to their business performance in the short to medium term, while enabling them to prepare for a future where blockchain is ready for mainstream use.

III. Outlook

When deployed on a wide scale, the blockchain could offer rich and exciting applications for MFIs. Smart contracts could enable MFIs to automate many processes that are performed manually today—for example, authorising a loan after verifying a user’s economic identity. The blockchain could also provide data for analytics, which could be used with machine learning algorithms or artificial intelligence to optimise loan amounts, terms, and interest rates, assess creditworthiness of unbanked customers, or identify fraudulent transactions.

However, blockchain still faces a range of technical, regulatory and practical challenges. It will take years of careful coordination and collaboration between global stakeholders to solve these challenges and prepare the blockchain for widespread use in the financial inclusion sector. Until then, the focus for MFIs should be on using technology that enables them to get the basics right: simpler administration, knowing their portfolio and serving more clients.



About Oradian

Oradian is a financial inclusion company serving financial institutions in remote, hard-to-reach communities. Using insights from their community of customers, Oradian builds a cloud-based toolset that smart financial institutions plug into to know and control their portfolios.

Oradian's toolset enables financial institutions to become more efficient, grow and serve more clients. Oradian provides access to its toolset on a subscription basis, making it possible for financial institutions to access leading technology.

Today, Oradian's community is made up of more than 65 financial institutions in eight countries with a concentration in the Philippines and Nigeria. Collectively, Oradian's community of financial institutions provides access to financial services for over two million end-clients throughout Southeast Asia, West Africa and East Africa.

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