

BLOCKCHAINS

ARCHITECTURE, DESIGN AND USE CASES

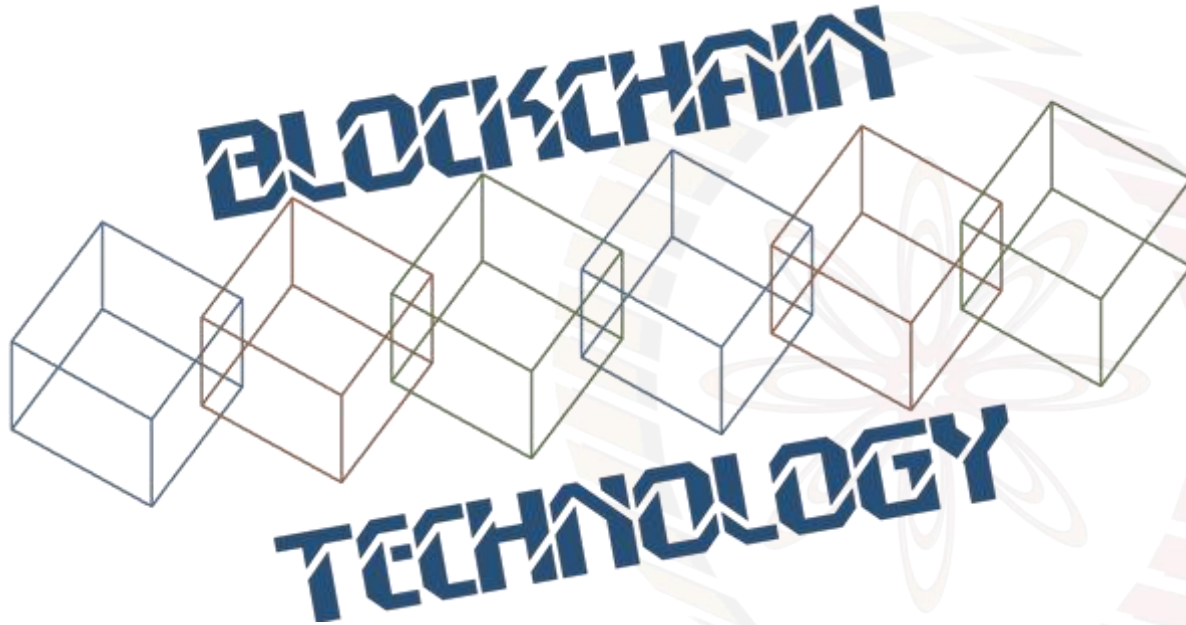
SANDIP CHAKRABORTY

**COMPUTER SCIENCE AND ENGINEERING,
IIT KHARAGPUR**

PRAVEEN JAYACHANDRAN

**IBM RESEARCH,
INDIA**

Image courtesy: <http://beetfusion.com/>



BLOCKCHAIN IN FINANCIAL SERVICES: COMPLIANCE AND MORTGAGE



Compliance (KYC, AML)



- Problems and deficiencies:
 - Work done in collecting KYC information unnecessarily replicated by multiple institutions
 - Isolated view of customers and their transactions insufficient to detect money laundering
 - Uncertainty in knowing if implemented practices are sufficient (over-stringent policy hurtful for business)
 - AML processes are too fragmented and dependent on subjective human decision making

Anti Money Laundering

**CEBTowerGroup Technical Abstract*

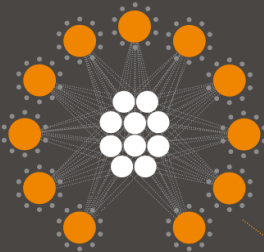
Know Your Customer (KYC)

DUPLICATION

An average of \$60m a year
is spent by FIs on KYC procedures.

For corporations it's a
repetitive process too.
One hypothetical
example could be...

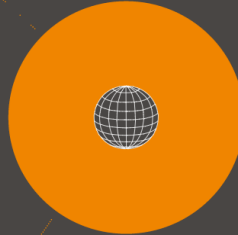
an average of
**11 banking
relationships globally**
+
10 documents
to open one account
=
sending documents
**110x to
different banks**



A huge challenge for all FIs is to keep up
to speed with ever-changing global KYC...

REGULATION

87% of banks and 56% of investment managers
think that a change in regulation and legislation is the most
influential factor for their KYC processes.



64%
identified reputational
risk as likely to influence
changes in their
KYC processes.

For both sides of the table, the current
due diligence process can be a major...

DISTRACTION

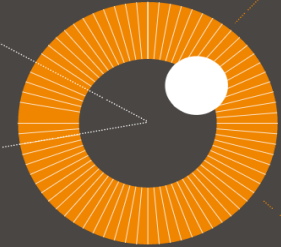
FIs can spend **24 days** to onboard a new client
22% higher than in the previous 12 months.

Throughout the
onboarding process,
corporates reported
they were contacted
on average:

8x

...but interestingly
banks contradicted
this by saying they
only made contact:

4x



FIs spend \$60m-\$500M annually on KYC/CDD
Average cost per new KYC Request is \$616
Anywhere between 5-100 documents for KYC
request

Regulations critical and increasing
In 2015 one regulatory alert every 12 minutes
Fines for non-compliance also increasing
e.g. BSI Bank shutdown in Singapore

30% of corporates report > 2 months
10% > 4 months

Source: 2016 Know Your Customer (KYC) Independent Survey (Thomson Reuters)

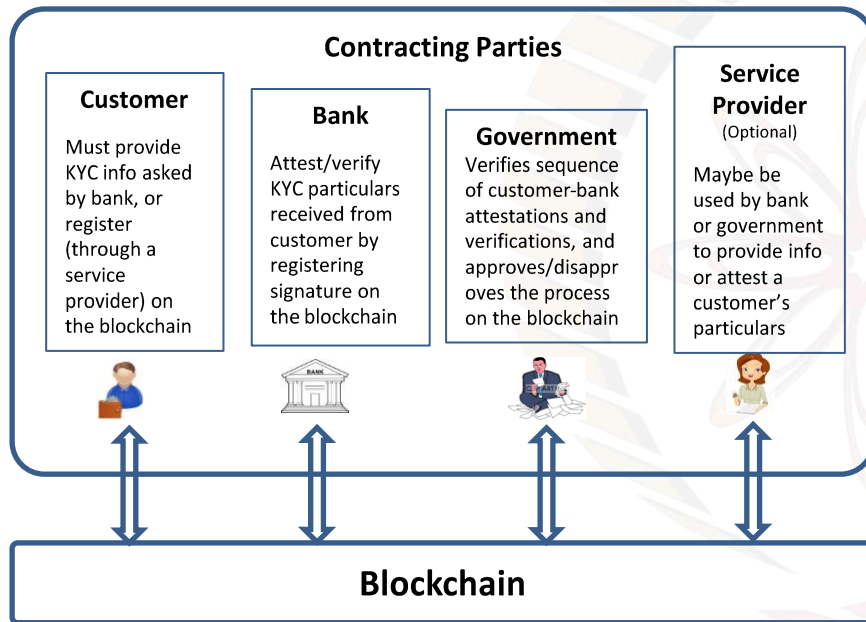
Shared KYC Solution

- Know your customer (KYC) is a regulator governed process of performing due diligence for verifying the identity of clients. KYC is a manual, time consuming and redundant across institutions
- Sharing KYC information on Blockchain would enable financial institutions to deliver better compliance outcomes, increase efficiency and improve customer experience

Key Pain Points and Solution Benefits

Pain Point	Solution Benefit
<ul style="list-style-type: none">• Redundancy: Most large FIs use similar data and processes to verify the same clients	<ul style="list-style-type: none">• Eliminate redundancy: Documentation needs to be verified only once before the approval information is shared
<ul style="list-style-type: none">• Inefficiency: Manual and time consuming process to gather and verify documentary evidence	<ul style="list-style-type: none">• Increase automation: Documents and approvals are digitized and can be verified without manual intervention
<ul style="list-style-type: none">• Lack of specificity: Requirements for due-diligence are often fuzzy, creating uncertainty on compliance to avoid legal sanction	<ul style="list-style-type: none">• Standardize process: Standardized, automated KYC processes sanctioned by regulators

Know Your Customer



Value proposition

- Avoid replication of KYC effort
- History of changes in identity or address can easily be tracked
- Government as a participating entity in the network can simplify auditing and monitoring
- Regulator-approved smart contracts can auditably record entire history of changes to KYC information
- Transition from periodic monitoring to real-time monitoring (self executing smart contracts)
- KYC and AML can be supported as utilities provided by third parties that multiple banks can leverage

Information Sharing

Doc Collection and Verification

- Controlled and recorded Customer Due Diligence process (CDD)
- Blockchain storage of hash

KYC Process

- Customer Due Diligence process info shared with anonymization

Proof of Authenticity

- Hash verification
- Continuous and automated auditing

Customer Provided & Owned Information

- Proof of Identity
- Proof of Address
- Other

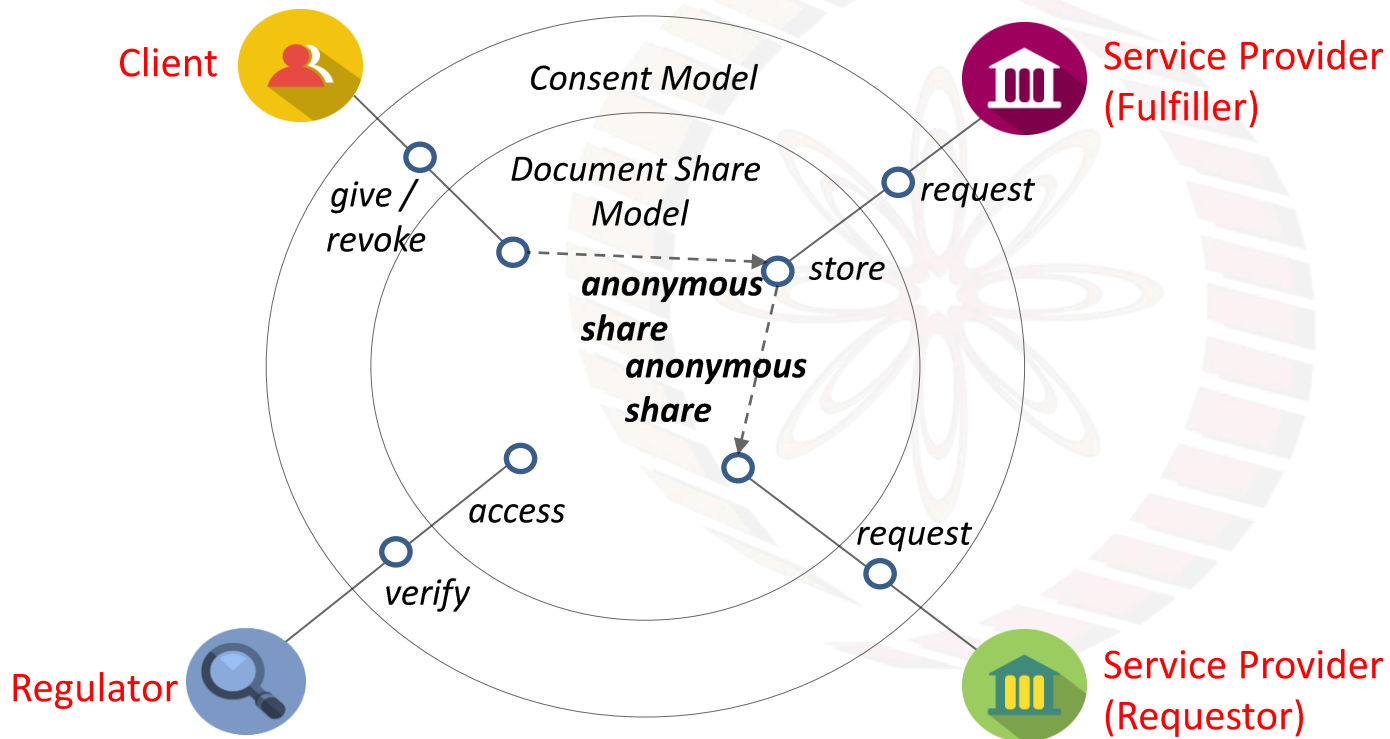
FI compiled information on customer

- Transaction Behavior

3rd Party provided customer information

- Credit Score

Privacy and Consent



Consent Model

Defines how access to profile and sensitive information is managed and granted or revoked by preserving the confidentiality of the relationship.

Document Share Model

Allows for anonymous but verifiable share of documents based upon consent.

Mortgage Processes

1 Mortgage Origination

- Mortgage Originators work with homeowners to generate mortgage loans
- Borrowers, appraisers, title companies, lenders provide data to originate the mortgage

Mortgage Originators

~30-90 days



Pain Points

- Time and Paper intensive process
- Too much back and forth between lender and homeowner; not streamlined
- No standardized formats for data
- 3rd Party (eg, Appraisers, title search) data ingestion is inefficient

2 Loan Servicing

- Loan servicers will engage with homeowners for the duration of the loan
- Serving institution will collect payments for the loans and distribute to investors
- Servicers will also negotiate loan modifications, conduct foreclosures, provide tax & insurance payments, etc.

Loan Servicers



Pain Points

- No standardized process & data formats
- Documents can be misplaced during default management process
- Some documents are still physically held
- Disparate IT systems (eg, default management, borrower engagement, payoff processes) increase number of manual process

3 Mortgage Securitization

- Vast majority of loans are sold to Government Sponsored Entities (GSEs) to be pooled to generate Agency MBS (Mortgage backed Securities)

GSEs



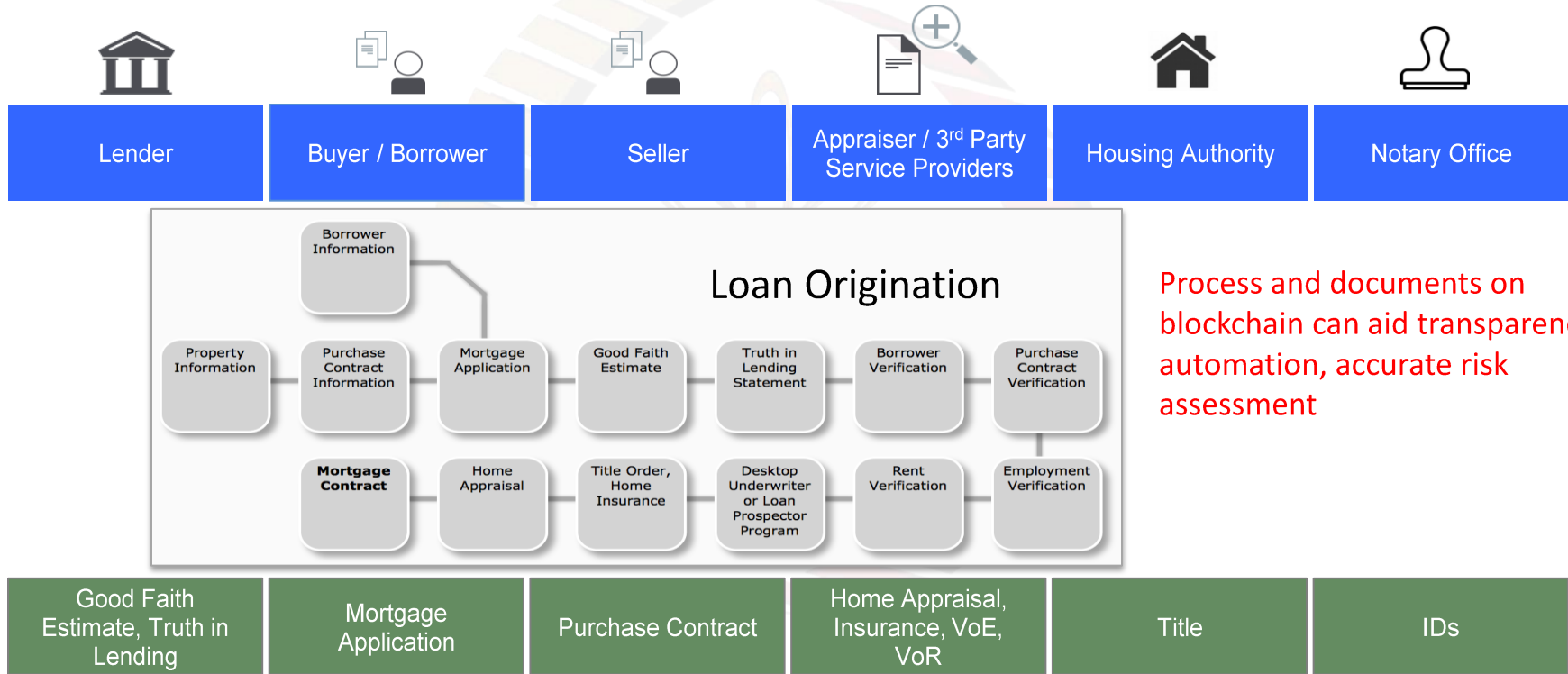
Investors



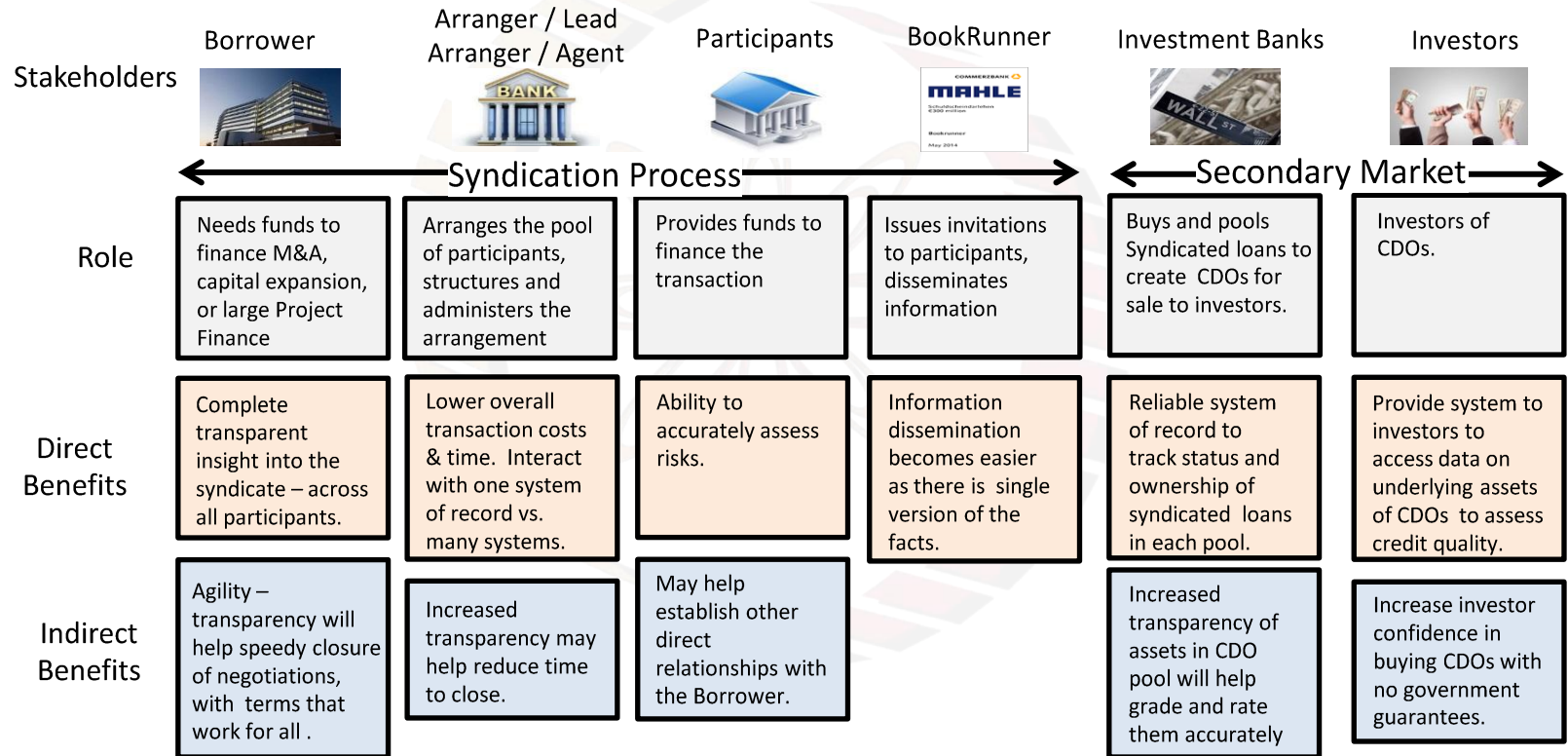
Pain Points

- Takes too much time for investor to conduct due diligence
- Investors not confident in the data provided from present system to take credit risks of buying non-agency MBS
- Lack of transparency on which assets are backing each tranche of the MBS

Example Mortgage Origination Process



Syndicated Loans



Fun Reading

- Know Your Customer, Wikipedia article: https://en.wikipedia.org/wiki/Know_your_customer
- “Why is KYC Mandatory Now?”, Reddit article: <http://business.rediff.com/report/2010/oct/18/perfin-why-kyc-is-mandatory-now.htm>
- Syndicated Loan, Wikipedia article: https://en.wikipedia.org/wiki/Syndicated_loan

A decorative background featuring a large, stylized wheel with a flower-like center. The wheel has a series of colored segments (yellow, orange, red, pink) around its perimeter. The flower has multiple petals in shades of yellow and orange.

thank you!

