Custodian Accounting of Electronic Mortgage

Section 1: Summary

Use Case Summary			
Use Case ID:	FIN-001	**Use Case Type:**	Vertical
Submission Date:	December 28, 2018	**Is Use Case supporting SDGs**	Yes
Use Case Title:	Custodian accounting of electronic mortgage	**Domain:**	List 8 Appendix 2
Status of Case	Pilot	**Sub-Domain**	1. Finance a. Financial management & accounting b. interbank payments c. Reduction of Fraud d. Financial messaging e. Asset lifecycles and history
Contact information of person submitting/ managing the use-case	Full Name: Dergachev Ivan Job Title: Project manager, Fintech Association E-mail address: ivan.dergachev@fintechru.org Telephone number: +7 926 773 77 74 Full Name: Alexander Chuburkov Job Title: Expert GOST R * Russian TC 26 Cryptography and security mechanisms * ISO TC 307 Blockchain & DLT * Fintech Association (RUS) * Chair WG4 FG DLT ITU-T E-mail address: chuburkovalex@gmail.com Telephone number: +7 965 336 62 92		
Proposing Organization	Fintech Association Address: 4 Shlyuzovaya Embankment, Moscow, 115114, Russia Web site: http://fintechru.org/		
Short Description	Masterchain is a P2P-network with access control. The communications between the nodes of this network are based on the modified Ethereum protocol. Masterchain provides for safe record of information in a distributed ledger. The copies of this ledger are kept at each node of the network. Here you can see the white paper of the Masterchain: http://fintechru.org/documents/Masterchain_whitepaper_v1.1_en.pdf		
Long description	**Masterchain is:** • System using blockchain, hierarchical, with a restriction on the addition of information; • Ledger type is replicated;		

- Financial organization included in the Masterchain-authorized user of the information system, which can be both a user-validator (confirming the creation of a new block) or a user-controller, and as a result of the consensus procedure - user-registrar of the information system;
- Conventional unit (token) - technological units of account/ specialized units of account;
- User-registrar's resource - the computing power of the node (pool) of the user-registrar, expressed in the number of calculations of the hash function per second.
- Type of consensus procedure - PoW.

Decentralized Depository system is a platform implemented in the Masterchain.
- Decentralized Depository system including electronic mortgages aims to combine the accounting systems of the depositories of the Russian Federation in the unified ledger . The DDS application is part of the initiative, which aims to translate the entire process of buying property from the selection of the object to the registration of mortgages and obtaining rights to real estate in the "online" and to make maximum transparency at all stages.
- DDS provides depositaries with the ability to perform the functions of storage and (or) accounting and confirmation of rights to electronic mortgagees to owners of mortgages or other persons exercising rights to electronic mortgages, conducting Depository operations, ensuring the accounting of mortgage parameters, as well as receiving reports on the status of mortgage registration in the Depository at any time.
- DDS allows exchanging information messages between depositories, including orders, keeping records of electronic mortgages on accounts provided by the Bank of Russia acts, storing files of electronic mortgages, as well as documents that can be created/issued in pursuance of electronic mortgages.
- Is necessary for conducting Depository accounting of electronic mortgages in connection with changes in the legislation of Russia, which introduces the concept of electronic mortgages - a non-documentary security, the rights of which are fixed in the form of an electronic document signed by an enhanced qualified electronic signature, which is stored in the Depository, in accordance with article 13.2 of the Federal law of 25.11.2018 No. 328-FL.

General principles of Depository accounting in DDS:
- Depository accounting of mortgage certificates is in pieces.
- Mortgages on Deposit accounts are accounted for on a double entry basis (in accordance with clause 5.1. Bank of Russia Regulation No. 503-P). Each mortgage in the Depository account must be recorded twice: once in the passive account and once in the active account for mortgages recorded in the Depository, the balance must be kept: the total number of mortgages recorded in the passive accounts of the depot must be equal to the total number of mortgages recorded in the active accounts.
- Depository operations are carried out on the principle of "two hands": the operator (it is possible to use the "technical user" in the system) and the controller.
- It is not allowed to have a negative balance of mortgages recorded on the depot account.

	Document accounting system: • A system of accounting for documents related to Depository accounting, as well as documents related to the storage, recording and transfer of rights to electronic mortgages should be organized within the framework of the DDS. Records of documents that have been received (incoming documents) or sent (outgoing documents) by the Depositary shall be accessible. • Document accounting system may include software hardware designed to generate, send and receive electronic documents.
SDG in Focus (when applicable)	

Value Transfer:	Reduce of the mortgage business process costs by 30%	**Number of Users:**	*10*

Types of Users:	**Business roles of DDS users:** • Record-keeping Depository - the Depository carries out the storage of the mortgage, that is, performs the function of storage information contained in the electronic mortgage and agreements to the electronic mortgage, as well as interaction with Rosreestr during registration, amendments in the mortgage, cancelling the mortgage. • Record-entry Depository - depositary carrying out accounting and transfer of mortgage rights. Does not store the mortgage, provides services for the accounting and transfer of rights for the mortgage. • Role combining the roles of the Depositary of storage and Depository of accounting rights.
Stakeholders	Fintech Association, Banks.
Data:	There are two different kinds of data stored in Masterchain. The first is open data, that is stored in ledger and is available for all users in network. The second type is confidential data. It is stored in special storage. Access rights to confidential data are configured in smart-contract called "Role Model".
Identification:	Addresses in network are calculated using certified cryptographic methods. These addresses within roles and access rights of users are stored in special smart-contract called "Whitelist". Each operation in network should pass an authorization using this contract.
Predicted Outcomes:	• Elimination of the risks inherent in a paper mortgage: the risks of loss of the mortgage and the need for a procedure for the mortification of rights under the lost mortgage. • Increasing transparency of interaction between mortgage market participants and regulators. • Acceleration of securitization: the process of portfolio valuation and sale of the fixed volume of mortgages.

Overview of the Business Problem or Opportunity
The objectives of the project: • Switching from paper documents to digital form due to Russian law • Optimization of the business process by dint of DLT

• Simplification of the procedure of securitization
For all participants of the business process it means a significant reduction of time (in 3-5 times). Process reduces the risk of falsification of the document. For Depository, it means a reduction of operating costs by 30% and simplification of furnishing of documents for the Regulator.The process of document verification is simplified for the Regulator.

| **Why Distributed Ledger Technology?** |
|---|
| The Blockchain and smart-contracts make this interaction trustworthy, transparent and understandable. The implementation of DLT solution, which allows tracking electronic mortgages, can eliminate paperwork and shorten the time of transaction. |

Section 2: Current process

Current Solutions
Documents exist in paper form.

| **Existing Flow (as-is)**		
Step	**User Actions**	**System Actions**
1.	Mortgage servicing	n/a
2.	Record-entry Depository receiving/sending information about the mortgage	n/a
3.	Mortgage expired	n/a

Process scheme (as-is)
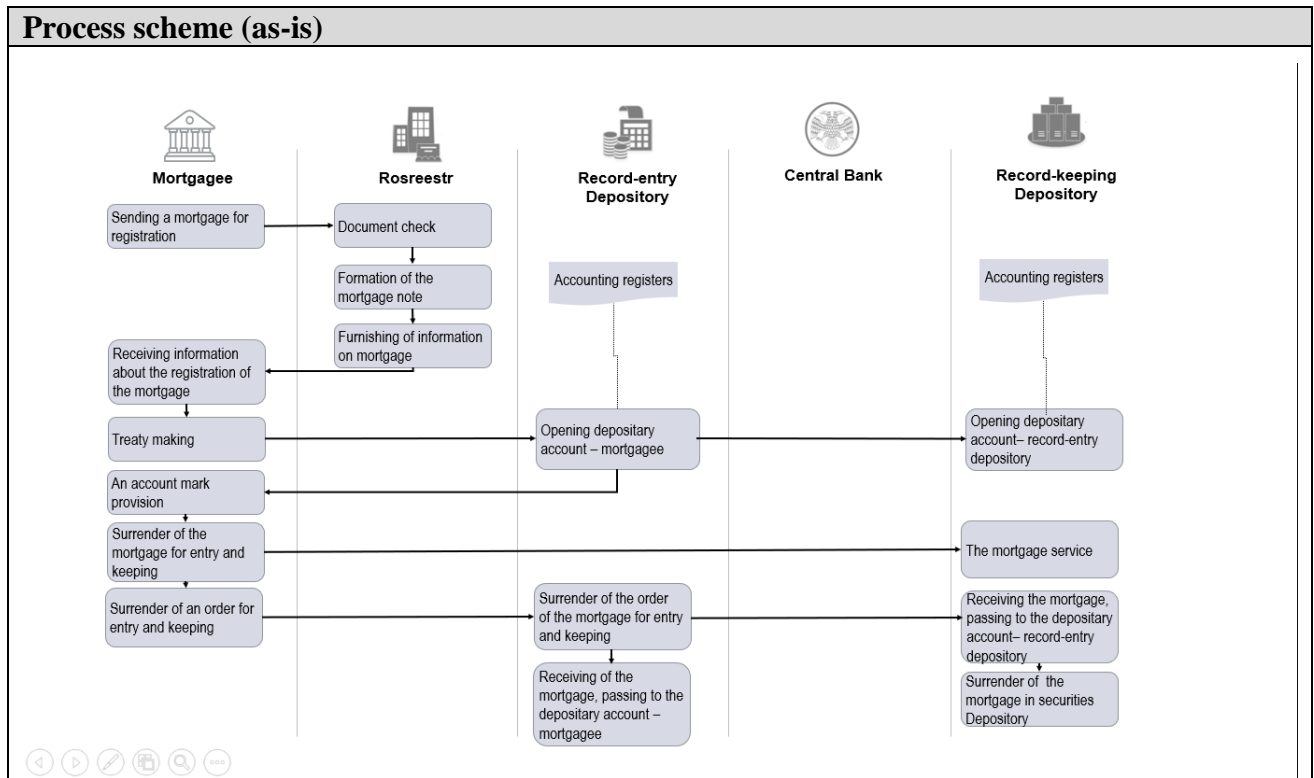
Data and information (as-is)

Data	Type	Description
1	Documents	Mortgage, agreements
2	Payment transactions	Payment of the fee

Participants and their roles (as-is)

Actor	Type/Role	Description
1	Mortgagee	Pledge holder
2	Rosreestr	Federal executive authority
3	Record-entry Depository	Participant of the securities market
4	Record-keeping Depository	Participant of the securities market
5	Central Bank	Central Bank of Russian Federation, Regulator

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Section 3: Expected process

Expected Flow (to-be)		
Step	**User Actions**	**System Actions**
1.	Mortgage servicing	System writes smart contract to the blockchain and save the contract to the distributed storage
2.	Depositary validates mortgage data from the blockchain and the distributed storage	System marks the smart contract and the contract from the distributed storage as validated by Depositary
3	Receiving/sending information about the mortgage	System marks the smart contract as active
4	The extension of the mortgage	System marks the smart contract as active. System saves hash of the documents to the blockchain and the consignment to the distributed storage
5	Changing conditions of the mortgage	System saves the data into distributed storage and blockchain
6	Mortgage expired	System finalizes the smart contract

Process scheme (to-be)
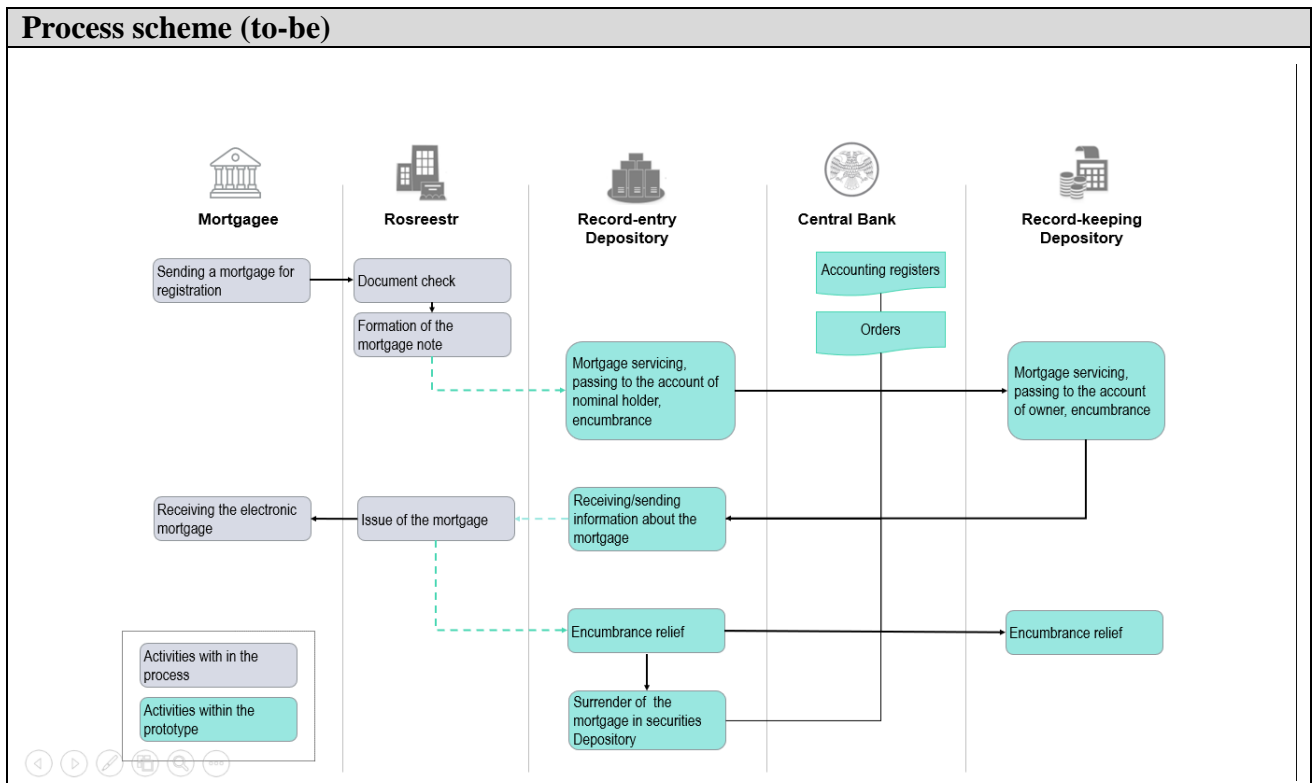
Participants and their roles		
Actor	**Type/Role**	**Description**
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Participants and their roles		
Actor	**Type/Role**	**Description**
2	Rosreestr	Federal executive authority
3	Record-entry Depository	Participant of the securities market
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5	Central Bank	Central Bank of Russian Federation, main top-tier Bank

Data and information		
Data	**Type**	**Description**
1	Documents	Documents hashes exchange in DLT-network
2	Payment transactions	Payment of the fee

Security and privacy
1. The mortgage conditions should be confidential to other blockchain network participants. 2. DLT-system should be able to provide mechanisms of mortgage documents and payments data integrity control; 3. Mortgage documents and payments data and related services (System Actions) should be available in 24/7/365 mode.

Main Success Scenario + expected time line
1.   Mortgage comes into force; 2.   Mortgage conditions adhered; 3.   Mortgage expired.

Conditions (pre- or post-)
1. All parties are connected to DLT-network

Performance needs
1. Volume of transactions > 700 Tx/day. 2. Network participants > 150

Legal considerations
Switching from paper documents to digital form.

Risks

1. Legal risks;
2. Security risks;
3. Risks related to DLT immaturity.

External References and Miscellaneous

GOST R 34.11-2012 (Streebog);

GOST R 34.10-2012;

GOST 28147-89 (Magma);

Appendix 1:
Domains and subdomains for use cases categorization

Vertical:

2. Finance
   a. Financial management & accounting
   b. International & interbank payments
   c. Clearing and settlement
   d. Reduction of Fraud
   e. Financial messaging
   f. Asset lifecycles and history
   g. Trade finance
   h. Regulatory compliance & audit
   i. AML/KYC
   j. Insurance
   k. Peer-to-peer transactions
3. Healthcare
   a. Pharma
   b. Biotechnology
   c. Medicine
4. Industries
   a. Manufacturing
   b. Energy
   c. Chemical
   d. Retail
   e. Real estate
   f. IT and telco
   g. Supply chain management
   h. Transportation
   i. Agriculture
5. Government and public sector
   a. Taxes
   b. Government and non-profit transparency
   c. Legislation, compliance & regulatory oversight
   d. Voting
   e. Taxation and customs
   f. Intellectual property management
   g. Land Registries

Horizontal:

1. Identity management
2. Security management
   a. Public Key Infrastructure
3. Internet of Things

4. Data processing, storage and management
   a. Data Validation (includes provenance)

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