

CLAIMS

What is claimed is:

1. A method comprising:

receiving, by one or more processing devices, a request to initiate a loan process from a user device, the request indicating a collateral item of a borrower;

generating, by the one or more processing devices, a virtual representation of the collateral item, wherein the virtual representation includes at least one of a description of the collateral item and one or more media contents that respectively depict at least a portion of the collateral item;

generating, by the one or more processing devices, a collateral token corresponding to the collateral item, wherein the collateral token is a digital token that is stored on a distributed ledger that is distributed across a set of node devices; and

instantiating, by the one or more processing devices, a loan process smart contract instance that includes computer-readable instructions that are configured to manage a loan process in accordance with a loan process workflow, wherein the loan process smart contract instance is executed at least in part by the set of node devices that store the distributed ledger, wherein the loan process smart contract instance is configured to:

 instantiate a loan smart contract that includes computer-readable instructions that are configured to:

 receive a loan agreement notification indicating one or more loan term parameters of a loan agreement that was agreed to by a lender and the borrower and to manage repayment of a loan based on the one or more loan term parameters,

 determine a loan repayment schedule based on a loan length and a loan amount of the loan as defined in the loan term parameters, and

 lock the collateral token in an escrow account stored on the distributed ledger until the loan smart contract instance determines a change of state of the loan that is relevant to a parameter of the loan that applies to an escrowing of the collateral, wherein the loan smart contract instance determines that the loan is in a default stage when a pre-defined amount of payments are not paid in accordance with the payment schedule and determines that the loan is in a repaid state when a balance of the loan is paid off in full.

2. The method of claim 1, wherein the computer-readable instructions of the loan process smart contract instance are further configured to instantiate an authentication smart contract instance that includes computer readable instructions that are configured to:

manage an authentication task that is performed by an authenticator to authenticate the collateral item, wherein the loan process smart contract instance instantiates the authentication smart contract instance in accordance with the loan process workflow that is defined in a system-level governance document that is stored on the distributed ledger and defines a condition to initiate the authentication task, and

issue an authentication notification upon confirming that the appraisal task has been completed.

3. The method of claim 2, wherein the authentication smart contract instance is further configured to:

receive an authentication report from an authenticator device of the authenticator, wherein the authentication report includes:

an authentication opinion of the authenticator that indicates an authentication state, including whether the authenticator has deemed the collateral item authentic or not authentic, and

supporting documentation provided by the authenticator in support of the authentication opinion,

wherein the authentication report is generated from a form template that is defined in accordance with an authentication stage-level governance that defines a set of requirements associated with performance of the authentication task, and one or more conditions that must be met to complete the authentication task and trigger a next stage in the loan process workflow to which the loan process adheres;

generate a data block containing the authentication report and a cryptographic hash value that is generated based at least in part on the authentication report; and

write the data block to the distributed ledger using the cryptographic hash value.

4. The method of claim 3, wherein the authentication smart contract instance initiates an escrowing of an amount of currency tokens and/or tokenized tokens from an account of the authenticator to the escrow account in response to the authentication report indicating that the

authenticator deemed the collateral item to be authentic.

5. The method of claim 1, wherein the computer-readable instructions of the loan process smart contract instance are further configured to:

 instantiate an appraisal smart contract instance in accordance that includes computer-readable instructions that are configured to:

 manage an appraisal task that is performed by an appraiser to determine an appraised value of the collateral item, wherein the loan process smart contract instance instantiates the appraisal smart contract instance in accordance with the loan process workflow that is defined in a system-level governance document that is stored on the distributed ledger and defines a condition to initiate the appraisal task; and

 issue an appraisal notification upon confirming that the appraisal task has been completed.

6. The method of claim 5, wherein the appraisal smart contract instance is further configured to:

 receive an appraisal report from an appraiser device of the appraiser, wherein the appraisal report includes:

 a valuation of the collateral item including at least one of an appraised value of the collateral item and a liquidation value of the collateral item, and

 one or more of a physical condition of the item, a new or used condition of the collateral item, a working condition of the collateral item, prices of previous sales of similar items, and a bluebook valuation of similar items,

 wherein the appraisal report is generated from a form template that is defined in accordance with an appraisal stage-level governance that defines a set of rules and regulations associated with performance of the appraisal task;

 generate a data block containing the appraisal report and a cryptographic hash value that is generated based at least in part on the appraisal report; and

 write the data block to the distributed ledger.

7. The method of claim 6, wherein the appraisal stage-level governance is at least partially

defined by an appraisal guild to which the appraiser is a guild member and defines an appraisal task workflow, wherein the appraisal task workflow includes one or more conditions that must be met to complete the appraisal task and trigger a next stage in the loan process workflow.

8. The method of claim 7, wherein the appraisal smart contract instance initiates an escrowing of a monetary amount of currency tokens and/or tokenized tokens from an account of the appraiser to the escrow account in response to receiving the appraisal report, wherein the monetary amount of currency tokens and/or tokenized tokens is equal to or less than the appraised value, wherein at least a portion of the escrowed amount is locked in the escrow account until the loan process is complete.

9. The method of claim 1, wherein the computer-readable instructions of the loan process smart contract instance are further configured to instantiate a safekeeping smart contract instance that includes computer-readable instructions that are configured to:

manage a safekeeping task performed by a safekeeper to securely store the collateral item during at least a portion of the loan process, wherein the loan process smart contract instance instantiates the safekeeping smart contract instance in accordance with the loan process workflow that is defined in a system-level governance document that is stored on the distributed ledger and defines a condition to initiate the safekeeping task; and

issue a safekeeping notification upon confirming that the safekeeping task has been completed.

10. The method of claim 9, wherein the safekeeping smart contract is further configured to: receive a safekeeping report from a safekeeper device of the safekeeper, wherein the safekeeping report includes:

a verification that the item is stored in a facility associated with the safekeeper,
indication of any visible damage observed by the safekeeper when the collateral item was received, including photo documentation of the visible damage observed by the safekeeper, and

supporting documentation provided by the safekeeping as proof of completion of the safekeeping task,

wherein the safekeeping report is generated from a safekeeping form template that is defined in accordance with a safekeeping stage-level governance that defines a set of rules and regulations associated with performance of the safekeeping task;

output the safekeeping notification to the loan process smart contract in response to receiving the safekeeping report from the safekeeper device, wherein the safekeeping notification causes the loan process smart contract instance to initiate the generation of the collateral token;

generate a data block containing the safekeeping report and a cryptographic hash value that is generated based at least in part on the safekeeping report; and

write the data block to the distributed ledger using the cryptographic hash.

11. The method of claim 10, wherein the safekeeping stage-level governance is at least partially defined by a safekeeper guild to which the safekeeper is a guild member, and defines a safekeeping task workflow, wherein the safekeeping task workflow includes one or more conditions that must be met to complete the safekeeping task and trigger a next stage in the loan process workflow.

12. The method of claim 11, wherein the safekeeping smart contract instance initiates an escrowing of a monetary amount of currency tokens and/or tokenized tokens from an account of the safekeeping to the escrow account in response to receiving the safekeeping report, wherein the monetary amount of currency tokens and/or tokenized tokens is equal to or less than an appraised value determined by an appraiser of the collateral item, and wherein at least a portion of the escrowed amount is locked in the escrow account until the loan process is complete.

13. The method of claim 1, wherein the loan smart contract instance is configured to:

initiate a liquidation event in response to determining that the loan is in a default state, wherein during the liquidation event, the collateral token is transferred to a buyer account of a buyer that purchases the collateral token, such that the buyer redeems the collateral token to take possession of the collateral item from a safekeeper that holds the collateral item for safekeeping.

initiate a transfer of the collateral token from the escrow account to an account of the borrower on the cryptographic ledger upon determining that the loan has been fully repaid,

wherein transferring the collateral token to a respective account from the escrow account

includes updating ownership data of the collateral token to indicate a public address of the respective account on the distributed ledger.

14. The method of claim 1, wherein the loan process workflow includes an authentication stage that defines an authentication task that is performed by an authenticator, an appraisal stage that defines an appraisal task that is performed by an appraiser, and a safekeeping stage that defines a safekeeping task that is performed by a safekeeper, wherein the authentication stage, the appraisal stage, and the safekeeping stage are executed before the collateral token is generated and the loan instance smart contract instance facilitates assigning rewards to the authenticator, the appraiser, and the safekeeper in response to completion of the loan process.

15. The method of claim 1, wherein the change of the state of the loan is one of: the loan entering the fully repaid state and the loan entering a default state.