CLAIMS

What is claimed is:

1. A server connected to a network, the server comprising:

a processor; and

memory storing instructions which when executed by the processor configure the processor to:

generate a database comprising:

a first data structure configured to store attributes of fungible assets, the attributes determining market values of the fungible assets, wherein the attributes include an asset type, valuation data, and geographic data of the fungible assets; and

a second data structure having fields referentially related to the attributes stored in the first data structure such that a change in any one of the fields induces a change in real time in a corresponding one of the attributes in the first data structure;

receive a stream of data regarding one or more of the attributes of the fungible assets from the network;

modify one or more of the fields of the second data structure based on the stream of data received from the network, wherein the first data structure is automatically updated in real time as the stream of data modifies the one or more of the fields of the second data structure, and wherein the updating of the first data structure automatically updates the attributes and valuations of the fungible assets in real time;

allow at least one of cycling, liquidating, and replenishing of one or more of the fungible assets associated with the first data structure based on the modified one or more fields of the second data structure;

maintain a relative value equivalence of the fungible assets based on the at least one of cycling, liquidating, and replenishing of the one or more of the fungible assets associated with the first data structure;

maintain a plurality of baskets of the fungible assets in the database, and wherein modifying the one or more of the fields of the second data structure automatically updates the attributes and valuations of the fungible assets across the baskets in real time;

at least one of securely validate, verify, record, trace, and track transactions for cryptocurrency specimens based on the stream of data, the cryptocurrency specimens having net cumulative values derived from digitized asset-backed mediums of exchange comprising one or more of the plurality of baskets; and

generate tokens based on one or more of the fungible assets for trading over one or more subnetworks that are controlled separately from the network; and

receive trading data associated with the trading of the tokens from the one or more subnetworks in the stream of data to update the attributes and valuations of the fungible assets underpinning the cryptocurrency specimens.

2. The server of claim 1 wherein the instructions further configure the processor to convert one or more digitized asset-backed mediums of exchange comprising one or more of the plurality of baskets into one or more cryptocurrency specimens.

3. The server of claim 1 wherein the instructions further configure the processor to securely validate, verify, record, trace, and track the transactions for the cryptocurrency specimens without using proof-of work mining based processes.

4. The server of claim 1 wherein the instructions further configure the processor to securely validate, verify, record, trace, and track the transactions for the cryptocurrency specimens by:

encoding the digitized asset-backed mediums of exchange with a history of attributes and activities unique to the one or more of the plurality of baskets underpinning the digitized asset-backed mediums of exchange;

verifying, using the encoding, that unitary ownership interests associated with the digitized asset-backed mediums of exchange are validly linked to the cryptocurrency specimens placed in and removed from external circulation; and

providing cryptographic keys for a dongle-based authentication system to create immutable and traceable data and records of the transactions for access using the dongle-based authentication system.

5. The server of claim 4 wherein the instructions further configure the processor to securely validate, verify, record, trace, and track the transactions for the cryptocurrency specimens by implementing one or more application programming interfaces that allow users dongle-based access to view and evaluate continuously updated and compiled price discovery data related to the net cumulative values of the cryptocurrency specimens.

6. The server of claim 5 wherein the instructions further configure the processor to securely validate, verify, record, trace, and track the transactions for the cryptocurrency specimens by:

interfacing, using the one or more application programming interfaces, with one or more graphical user interfaces configured to:

provide bids, offers, and executed prices attendant to each underlying net cumulative value component to the users; and

allow the users to post counter prices of net cumulative value components via iterative processes culminating in execution of the transactions of the cryptocurrency specimens with a specific time and date stamp.

7. The server of claim 1 wherein the instructions further configure the processor to account for and reconcile periodically reported information for each unitary ownership-based cryptocurrency specimen in circulation over the network.

8. The server of claim 1 wherein the instructions further configure the processor to encode the digitized asset-backed mediums of exchange with a history of attributes and activities unique to the one or more of the plurality of baskets underpinning the digitized asset-backed mediums of exchange that have migrated through formulation, securitization, issuance, and initial valuation processes as of a specified date of origin.

9. The server of claim 8 wherein the instructions further configure the processor to verify, using the encoding, that unitary ownership interests associated with the digitized asset-backed mediums of exchange are validly linked to the cryptocurrency specimens placed in and removed from external circulation.

10. The server of claim 8 wherein the instructions further configure the processor to generate cryptographic keys for a dongle-based authentication system to create immutable and traceable data and records of the transactions for access using the dongle-based authentication system.

11. The server of claim 1 wherein the instructions further configure the processor to implement one or more application programming interfaces that allow users dongle-based access to view and evaluate continuously updated and compiled price discovery data related to the net cumulative values of the cryptocurrency specimens.

12. The server of claim 11 wherein the instructions further configure the processor to interface, using the one or more application programming interfaces, with one or more graphical user interfaces configured to provide bids, offers, and executed prices attendant to each underlying net cumulative value component to users.

13. The server of claim 11 wherein the instructions further configure the processor to interface, using the one or more application programming interfaces, with one or more graphical user interfaces configured to allow the users to post counter prices of net cumulative value components per iterative processes culminating in execution of the transactions of the cryptocurrency specimens with a specific time and date stamp.

14. The server of claim 1 wherein the stream of data is based on trading activity associated with the one or more of the fungible assets over the network.

15. The server of claim 1 wherein the instructions further configure the processor to receive via the network buy and sell orders from counterparties for trading one or more of the fungible assets in the baskets and to match the orders based on practically opposite rather than absolute opposite trading interests of the counterparties while maintaining the relative value equivalence of the fungible assets in the baskets.

16. The server of claim 15 wherein the instructions further configure the processor to generate a weighted average benchmark based on a plurality of asset forms of one or more of the fungible assets and to match the orders using the weighted average benchmark.

17. The server of claim 15 wherein the instructions further configure the processor to provide liquidity and physical delivery of the traded fungible assets to the counterparties via the network upon matching the orders while maintaining the relative value equivalence of the fungible assets in the baskets.

18. The server of claim 1 further comprising a dongle that cryptographically authenticates access to the server via the network and that secures data transfers between the server and the network.

19. The server of claim 1 further comprising a dongle that provides transformational data protection via encryption that adds authentication and fault tolerant information to data transfers between the server and the network.

20. The server of claim 17 wherein the instructions further configure the processor to align the orders to comply with Sharia law.

21. The server of claim 1 wherein the instructions further configure the processor to generate a digitized medium of exchange that is based on a set of baskets comprising the fungible assets and that is usable for trading the fungible assets over the network.

22. The server of claim 21 wherein the instructions further configure the processor to securitize and tokenize the digitized medium of exchange for trading the fungible assets over the network.

23. The server of claim 1 wherein the instructions further configure the processor to securely validate, verify, record, trace, and track the transactions for the cryptocurrency specimens using processes selected from a group consisting of proof of work, proof of stake, delegated proof of stake, proof of capacity, proof of elapsed time, proof of identity, proof of authority, and proof of activity.

24. A system comprising:
a server comprising:

a processor; and

memory storing instructions which when executed by the processor configure the processor to:

generate a database comprising:

a first data structure configured to store attributes of fungible assets, the attributes determining market values of the fungible assets, wherein the attributes include an asset type, valuation data, and geographic data of the fungible assets; and

a second data structure having fields referentially related to the attributes stored in the first data structure such that a change in any one of the fields induces a change in real time in a corresponding one of the attributes in the first data structure;

receive a stream of data regarding one or more of the attributes of the fungible assets from the network;

modify one or more of the fields of the second data structure based on the stream of data received from the network, wherein the first data structure is automatically updated in real time as the stream of data modifies the one or more of the fields of the second data structure, and wherein the updating of the first data structure automatically updates the attributes and valuations of the fungible assets in real time;

allow at least one of cycling, liquidating, and replenishing of one or more of the fungible assets associated with the first data structure based on the modified one or more fields of the second data structure;

maintain a relative value equivalence of the fungible assets based on the at least one of cycling, liquidating, and replenishing of the one or more of the fungible assets associated with the first data structure;

maintain a plurality of baskets of the fungible assets in the database, and wherein modifying the one or more of the fields of the second data structure automatically updates the attributes and valuations of the fungible assets across the baskets in real time; and

at least one of securely validate, verify, record, trace, and track transactions for cryptocurrency specimens based on the stream of data, the cryptocurrency specimens having net cumulative values derived from digitized asset-backed mediums of exchange comprising one or more of the plurality of baskets;and

generate tokens based on one or more of the fungible assets for trading over one or more subnetworks that are controlled separately from the network; and

receive trading data associated with the trading of the tokens from the one or more subnetworks in the stream of data to update the attributes and valuations of the fungible assets underpinning the cryptocurrency specimens,

the system further comprising one or more subnetworks, the one or more subnetworks comprising respective subnetwork servers configured to securely validate, verify, record, trace, and track the trades of the tokens by:

encoding the tokens with a history of attributes and activities unique to the one or more of the plurality of baskets underpinning the digitized asset-backed mediums of exchange;

verifying, using the encoding, that unitary ownership interests associated with the digitized asset-backed mediums of exchange are validly linked to the tokens placed in and removed from external circulation; and

providing cryptographic keys for a dongle-based authentication system to create immutable and traceable data and records of the trades for access using the dongle-based authentication system.

25. The system of claim 24 wherein the subnetwork servers are configured to process buy and sell orders from counterparties for trading the tokens and to match, clear, and settle the orders based on absolute opposite trading interests of the counterparties and to provide liquidity to the counterparties for the settled orders.

26. The system of claim 24 wherein the subnetwork servers are configured to securely validate, verify, record, trace, and track the trades of the tokens by implementing one or more application programming interfaces that allow traders dongle-based access to the server to view and evaluate continuously updated price discovery data compiled at the server.

27. A server connected to a network, the server comprising:

a processor; and

memory storing instructions which when executed by the processor configure the processor to:

generate a database comprising:

a first data structure configured to store attributes of fungible assets, the attributes determining market values of the fungible assets; and

a second data structure having fields referentially related to the attributes stored in the first data structure such that a change in any one of the fields induces a change in real time in a corresponding one of the attributes in the first data structure;

receive a stream of data regarding one or more of the attributes of the fungible assets from the network;

modify one or more of the fields of the second data structure based on the stream of data received from the network, wherein the first data structure is automatically updated in real time as the stream of data modifies the one or more of the fields of the second data structure, and wherein the updating of the first data structure automatically updates the attributes and valuations of the fungible assets in real time;

maintain a plurality of baskets of the fungible assets in the database, and wherein modifying the one or more of the fields of the second data structure automatically updates the attributes and valuations of the fungible assets across the baskets in real time;

at least one of securely validate, verify, record, trace, and track transactions for cryptocurrency specimens based on the stream of data, the cryptocurrency specimens having net cumulative values derived from digitized asset-backed mediums of exchange comprising one or more of the plurality of baskets;

generate tokens based on one or more of the fungible assets for trading over one or more subnetworks that are controlled separately from the network; and

receive trading data associated with the trading of the tokens from the one or more subnetworks in the stream of data to update the attributes and valuations of the fungible assets underpinning the cryptocurrency specimens.

28. The server of claim 27 wherein the instructions further configure the processor to allow at least one of cycling, liquidating, and replenishing of one or more of the fungible assets associated with the first data structure based on the modified one or more fields of the second data structure.

29. The server of claim 28 wherein the instructions further configure the processor to maintain a relative value equivalence of the fungible assets based on the at least one of cycling, liquidating, and replenishing of the one or more of the fungible assets associated with the first data structure.

30. The server of claim 27 wherein the attributes include an asset type, valuation data, and geographic data of the fungible assets.

31 The server of claim 27 wherein the instructions further configure the processor to convert one or more digitized asset-backed mediums of exchange comprising one or more of the plurality of baskets into one or more cryptocurrency specimens.

32. The server of claim 27 wherein the instructions further configure the processor to securely validate, verify, record, trace, and track the transactions for the cryptocurrency specimens without using proof-of work mining based processes.

33. The server of claim 27 wherein the instructions further configure the processor to securely validate, verify, record, trace, and track the transactions for the cryptocurrency specimens by:

encoding the digitized asset-backed mediums of exchange with a history of attributes and activities unique to the one or more of the plurality of baskets underpinning the digitized asset-backed mediums of exchange;

verifying, using the encoding, that unitary ownership interests associated with the digitized asset-backed mediums of exchange are validly linked to the cryptocurrency specimens placed in and removed from external circulation; and

providing cryptographic keys for a dongle-based authentication system to create immutable and traceable data and records of the transactions for access using the dongle-based authentication system.

34. The server of claim 33 wherein the instructions further configure the processor to securely validate, verify, record, trace, and track the transactions for the cryptocurrency specimens by implementing one or more application programming interfaces that allow users

dongle-based access to view and evaluate continuously updated and compiled price discovery data related to the net cumulative values of the cryptocurrency specimens.

35. The server of claim 32 wherein the instructions further configure the processor to securely validate, verify, record, trace, and track the transactions for the cryptocurrency specimens by:

interfacing, using the one or more application programming interfaces, with one or more graphical user interfaces configured to:

provide bids, offers, and executed prices attendant to each underlying net cumulative value component to the users; and

allow the users to post counter prices of net cumulative value components via iterative processes culminating in execution of the transactions of the cryptocurrency specimens with a specific time and date stamp.

36. The server of claim 27 wherein the instructions further configure the processor to account for and reconcile periodically reported information for each unitary ownership-based cryptocurrency specimen in circulation over the network.

37. The server of claim 27 wherein the instructions further configure the processor to encode the digitized asset-backed mediums of exchange with a history of attributes and activities unique to the one or more of the plurality of baskets underpinning the digitized asset-backed mediums of exchange that have migrated through formulation, securitization, issuance, and initial valuation processes as of a specified date of origin.

38. The server of claim 37 wherein the instructions further configure the processor to verify, using the encoding, that unitary ownership interests associated with the digitized asset-backed mediums of exchange are validly linked to the cryptocurrency specimens placed in and removed from external circulation.

39. The server of claim 37 wherein the instructions further configure the processor to generate cryptographic keys for a dongle-based authentication system to create immutable and traceable data and records of the transactions for access using the dongle-based authentication system.

40. The server of claim 27 wherein the instructions further configure the processor to implement one or more application programming interfaces that allow users dongle-based access to view and evaluate continuously updated and compiled price discovery data related to the net cumulative values of the cryptocurrency specimens.

41. The server of claim 40 wherein the instructions further configure the processor to interface, using the one or more application programming interfaces, with one or more graphical user interfaces configured to provide bids, offers, and executed prices attendant to each underlying net cumulative value component to users.

42. The server of claim 40 wherein the instructions further configure the processor to interface, using the one or more application programming interfaces, with one or more graphical user interfaces configured to allow the users to post counter prices of net cumulative value components per iterative processes culminating in execution of the transactions of the cryptocurrency specimens with a specific time and date stamp.

43. The server of claim 27 wherein the instructions further configure the processor to securely validate, verify, record, trace, and track the transactions for the cryptocurrency specimens using processes selected from a group consisting of proof of work, proof of stake, delegated proof of stake, proof of capacity, proof of elapsed time, proof of identity, proof of authority, and proof of activity.

44. A system comprising:
a server and comprising:
a processor; and
memory storing instructions which when executed by the processor configure the processor to:

generate a database comprising:

a first data structure configured to store attributes of fungible assets, the attributes determining market values of the fungible assets; and

a second data structure having fields referentially related to the attributes stored in the first data structure such that a change in any one of the fields induces a change in real time in a corresponding one of the attributes in the first data structure;

receive a stream of data regarding one or more of the attributes of the fungible assets from the network;

modify one or more of the fields of the second data structure based on the stream of data received from the network, wherein the first data structure is automatically updated in real time as the stream of data modifies the one or more of the fields of the second data structure, and wherein the updating of the first data structure automatically updates the attributes and valuations of the fungible assets in real time;

maintain a plurality of baskets of the fungible assets in the database, and wherein modifying the one or more of the fields of the second data structure automatically updates the attributes and valuations of the fungible assets across the baskets in real time;

at least one of securely validate, verify, record, trace, and track transactions for cryptocurrency specimens based on the stream of data, the cryptocurrency specimens having net cumulative values derived from digitized asset-backed mediums of exchange comprising one or more of the plurality of baskets;

generate tokens based on one or more of the fungible assets for trading over one or more subnetworks that are controlled separately from the network; and

receive trading data associated with the trading of the tokens from the one or more subnetworks in the stream of data to update the attributes and valuations of the fungible assets underpinning the cryptocurrency specimens,

the system further comprising one or more subnetworks, the one or more subnetworks comprising respective subnetwork servers configured to securely validate, verify, record, trace, and track the trades of the tokens by:

encoding the tokens with a history of attributes and activities unique to the one or more of the plurality of baskets underpinning the digitized asset-backed mediums of exchange;

verifying, using the encoding, that unitary ownership interests associated with the digitized asset-backed mediums of exchange are validly linked to the tokens placed in and removed from external circulation; and

providing cryptographic keys for a dongle-based authentication system to create immutable and traceable data and records of the trades for access using the dongle-based authentication system.

45. The system of claim 44 wherein the subnetwork servers are configured to process buy and sell orders from counterparties for trading the tokens and to match, clear, and settle the orders based on absolute opposite trading interests of the counterparties and to provide liquidity to the counterparties for the settled orders.

46. The system of claim 44 wherein the subnetwork servers are configured to securely validate, verify, record, trace, and track the trades of the tokens by implementing one or more application programming interfaces that allow traders dongle-based access to the server to view and evaluate continuously updated price discovery data compiled at the server.