

Independent Claim 5 (Business Method – Automated RWA Digital Twin Monetization)

A business method for monetizing tokenized digital twins of any physical asset or RWA via IoT and blockchain, comprising: instrumenting facilities with IoT sensors, routers, and gateways to generate verifiable RWA data; certifying the data and issuing a value token on a blockchain ledger as the immutable digital twin; and providing a blockchain-based commodity, crypto, or security exchange that enables real-time trading, swapping, and derivatives with automatic ownership transfer and payment settlement on each executed trade.

Dependent Claims for Independent Claim 5

The following is a complete set of dependent claims (Claims 2–22) that further specify and narrow the business method of Independent Claim 5. Each dependent claim is fully supported by the disclosures in the attached document (Patent Filing Highlights US20220180374A1.pdf), including the detailed descriptions of IoT instrumentation of physical facilities/infrastructure, real-time/continuous data generation from sensors/routers/gateways, automated calculation/validation/certification in the cloud platform, value token issuance on the blockchain ledger (primary-market activity, immutable digital twin representation with cryptographic elements), integrated blockchain trading venue functionality (conventional and advanced order types, real-time execution, automated ownership transfer and fund settlement), immutable recording with cryptographic hashing, fraud reduction/permanent verification/auditability, redundant ledger copies, elimination of intermediaries, closed-loop automation, and the overall IoT-and-blockchain monetization cycle for tokenized digital twins of any physical asset or RWA as of the December 26, 2017 priority date.

Full Claim Set in Formal USPTO-Style Format (Reordered to Start with Claim 1)

1. A business method for monetizing tokenized digital twins of any physical asset or RWA via IoT and blockchain, comprising: instrumenting facilities with IoT sensors, routers, and gateways to generate verifiable RWA data; certifying the data and issuing a value token on a blockchain ledger as the immutable digital twin; and providing a blockchain-based commodity, crypto, or security exchange that enables real-time trading, swapping, and derivatives with automatic ownership transfer and payment settlement on each executed trade.
2. The business method of claim 1, wherein instrumenting facilities further comprises deploying IoT sensors, edge routers, and edge gateways configured to communicate using one or more wireless protocols selected from the group consisting of Bluetooth, Zigbee, WiFi, Z-Wave, Sub-Gigahertz, Cellular, Satellite, LoRaWAN, Sigfox, and combinations thereof.
3. The business method of claim 1, wherein generating verifiable RWA data is performed continuously or in real time from the instrumented physical facilities, infrastructure, renewable resources, or efficiency systems.
4. The business method of claim 1, wherein certifying the data further comprises performing automated validation using processes for accuracy, sampling design, internal controls, and verification consistent with established standards for real-world asset certification.

5. The business method of claim 1, wherein issuing the value token comprises recording the value token as an immutable digital asset on the blockchain ledger that includes one or more of public-key addresses, cryptographic block linking, timestamps, transaction data, user identifiers, equipment identifiers, validation reports, and verification statements.
6. The business method of claim 1, wherein issuing the value token further comprises registering all participants and equipment on the blockchain ledger to prevent double-spending or fraud.
7. The business method of claim 1, wherein issuing the value token is performed as a primary market activity based on the certified RWA data from the IoT sensors, routers, and gateways.
8. The business method of claim 1, wherein the blockchain-based commodity, crypto, or security exchange functions as an integrated exchange without requiring separate centralized custodians or clearinghouses.
9. The business method of claim 1, wherein the blockchain-based exchange enables real-time trading, swapping, and derivatives using market orders, limit orders, options, forwards, futures, swaps, or pre-market contracts.
10. The business method of claim 1, wherein the blockchain-based exchange further supports advanced order types selected from the group consisting of short selling, trailing stop orders, conditional orders, One-Triggers-the-Other (OTO) orders, One-Cancels-the-Other (OCO) orders, One-Triggers-a-One-Cancels-the-Other (OTOCO) orders, and combinations thereof.
11. The business method of claim 1, wherein the blockchain-based exchange applies time-in-force rules to orders, the time-in-force rules selected from the group consisting of day orders, good-'til-canceled orders (up to 180 days), fill-or-kill orders, immediate-or-cancel orders, on-the-open orders, on-the-close orders, and combinations thereof.
12. The business method of claim 1, wherein the blockchain automatically effects ownership transfer of the value token (digital twin) and fund settlement in real time or near real time upon each executed trade.
13. The business method of claim 1, wherein the blockchain records each executed trade as a new cryptographically hashed block on the distributed ledger.
14. The business method of claim 1, wherein all transactions, ownership transfers, swaps, derivatives, and fund settlements are permanently recorded on the blockchain ledger to reduce fraud and ensure permanent verification and auditability of the tokenized digital twin.
15. The business method of claim 1, wherein the blockchain ledger maintains multiple redundant copies across cloud environments to provide fault tolerance and Byzantine fault tolerance during trading and settlement operations.
16. The business method of claim 1, further comprising automated monetization by transferring funds to the seller while simultaneously delivering the value token (digital twin) to the buyer upon execution of each trade.
17. The business method of claim 1, wherein the business method operates in a closed-loop automated process from IoT instrumentation through data certification, value token

issuance, and real-time trading, swapping, and derivatives on the integrated blockchain-based exchange.

18. The business method of claim 1, wherein the distributed ledger employs cryptographic hashing of each new block to prior blocks to ensure immutability of all tokenized digital twin records and trading transactions.
19. The business method of claim 1, wherein the method eliminates intermediaries by performing end-to-end monetization—including instrumentation, certification, token issuance, trading, swapping, derivatives, ownership transfer, and fund settlement—directly through the IoT-and-blockchain-integrated platform.
20. The business method of claim 1, wherein the value token represents an immutable digital twin of any commodity, security, physical asset, financial instrument, or other RWA that is verifiable and cannot be double-spent due to the immutable nature of the blockchain ledger.
21. The business method of claim 1, wherein the integrated blockchain-based exchange supports high-frequency, derivative, and institutional trading of tokenized digital twins of any physical asset or RWA while maintaining permanent auditability and fraud reduction through immutable ledger recording.
22. The business method of claim 1, wherein the business method provides scalable, fraud-resistant monetization of tokenized digital twins of any physical asset or RWA at industrial scale by combining real-time IoT instrumentation with automated blockchain execution, settlement, and derivatives.

These claims form a self-contained, commercially robust claim family that directly maps to the business method for monetizing tokenized digital twins of any physical asset or RWA via IoT and blockchain, including instrumentation, certification, value token issuance, and integrated real-time trading/swapping/derivatives functionality as described in the December 26, 2017 provisional disclosure (and the incorporated earlier provisionals). The full set (renumbered to begin with Claim 1) can be incorporated into a non-provisional, continuation, or continuation-in-part application (alone or in combination with the claim families of Independent Claims 1–4) to further strengthen the Parisii patent portfolio for tokenized Real World Assets and blockchain-based RWA/digital twin infrastructure.