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OPTIMIZATION OF DIGITAL ASSET SELECTION THROUGH ARTIFICIAL INTELLIGENCE AND RELATED METHODS

Abstract

Computer-implemented method, and system implementing the same, for optimizing digital asset transactions, may include: custodying in one or more first data storage system digital assets. The method may determine with a transaction optimizer module of an intelligent computing system an optimal combination of digital assets for a transaction based on a set of factors. The method may further receive from the intelligent computing system into the one or more first data storage system the optimal combination digital assets for the transaction. The method may further send with the one or more first data storage system the optimal combination of digital assets to one or more second data storage system.

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Background/Summary

CROSS-REFERENCE TO RELATED APPLICATIONS [0001] This application benefits from and claims priority to U.S. Provisional Patent Application Ser. No. 63/554,969, filed Feb. 17, 2024 and which is incorporated by reference in its entirety herein.

TECHNICAL FIELD
[0002] The invention pertains to the use of artificial intelligence in at least one digital wallet to optimize the combination of various digital assets for transactions, including cryptocurrencies, non-fungible tokens, and tokenized real-world assets.
BACKGROUND DESCRIPTION
[0003] In the rapidly evolving world of digital assets, a variety of cryptocurrencies, non-fungible tokens, tokenized real-world assets, and tokenized securities have emerged as new forms of value. These digital assets are increasingly being used for the purchase of goods and services, or being used in various forms of financial products or transactions. However, the use of these assets is not without its challenges.
[0004] One of the primary challenges is the limitation of using only one type of digital asset for a transaction, despite the fact that a user's digital wallet may hold multiple types of assets or a user may have multiple digital wallets for different asset types. This limitation can be inconvenient and inefficient, particularly when a user wishes to optimize their use of digital assets for tax, return, or other compliance purposes.
[0005] Additionally, the process of selecting the right combination of digital assets for a transaction can be time-consuming and complex. This process often resembles a barter system, where the payer and payee must negotiate in real time the combination of digital assets needed to settle a transaction.
[0006] Moreover, the acceptance of digital assets as payment is not universal. While some payees may be willing to accept a combination of digital assets, others may prefer or only accept certain types of assets. This further complicates the transaction process and can limit the utility of digital assets.
SUMMARY
[0007] In summary, the current landscape of digital asset transactions presents several challenges related to the selection and use of digital assets, the negotiation of transactions, and the acceptance of digital assets as payment. These challenges hinder the efficiency and potential of digital asset transactions. Unlike a traditional manual barter system involving FIAT currency and or other traditional assets, digital assets pose unique challenges that make real-time manual barter impossible and/or inefficient. For example, digital assets are traded 24/7, 365 days per year on multiple exchanges: with each exchange having a slightly different price for the same asset. This is not the case with more traditional assets like stocks or bonds. Further, crypto currencies have unique tax implications and regulatory designations (which can vary from country to country) that are not present with FIAT currency. For example, BTC is treated as a commodity under CFTC guidelines while SOL is arguably a security according to the SEC. Finally, some digital assets may have been previously owned by companies or individuals that are on sanctions lists (e.g. OFAC), which prohibits their further transfer. This introduces complex dynamics not seen with traditional bartering systems.
[0008] Thus, a system and method are needed that can transform a traditional bartering system into the digital asset realm. The system and method must consider the unique aspects of digital assets (e.g. 24/7 real-time trading; various regulatory designations; tax implications; compliance) in addition to traditional aspects such as price of the goods/services being transacted and desired payment type.

[0009] In accordance with embodiments, a computer-implemented method is provided for optimizing digital asset transactions. Digital currencies or tokens are custodied in one or more first data storage system. Data from the one or more first data storage system, which includes the type of digital currencies or tokens stored, is sent into an intelligent computing system. The intelligent computing system determines an optimal combination of digital currencies or tokens for the transaction based on a set of factors. The optimal combination of digital currencies or tokens for the transaction is received from the intelligent computing system into the one or more first data storage system and sent to one or more second data storage system.
[0010] In accordance with other embodiments, a system is provided for optimizing digital asset transactions. The system comprises one or more first data storage system for custodying digital currencies or tokens, an intelligent computing system that uses data from the one or more first data storage system, and an optimal combination of digital currencies or tokens for the transaction based on a set of factors determined with the intelligent computing system. The one or more first data storage system is configured to send to one or more second data storage system the optimal combination of digital currencies or tokens.
[0011] In yet other embodiments, a non-transitory computer-readable medium is provided storing instructions that, when executed by a computer, cause the computer to perform a method for optimizing digital asset transactions. The method includes receiving data from one or more first data storage system, determining an optimal combination of digital currencies or tokens for the transaction based on a set of factors, and sending to the one or more first data storage system the optimal combination of digital currencies or tokens for the transaction.
[0012] The custodying can be self-custody (e.g. Metamask wallet) or institutional custody (e.g. Coinbase PRIME), or a combination. In the above embodiments, the intelligent computing system may utilize an orchestration layer coupled to the one or more first data storage system to coordinate the transfer of one or more digital currencies or tokens. The orchestration layer acts as a digital protocol bridge when the digital currencies or tokens operate on different blockchain networks or blockchain protocols.

Description

BRIEF DESCRIPTION OF THE FIGURES
[0013] FIG. **1** shows an example system for optimizing digital transactions, in an embodiment.
[0014] FIG. **2** is a flow diagram of an example method of optimizing digital asset transactions using an artificial intelligence engine in a digital asset wallet in accordance with certain embodiments described herein.
DETAILED DESCRIPTION
[0015] FIG. **1** shows an example system **100** for optimizing digital transactions, in an embodiment. In the embodiments herein, an example use case involves a first user **102** (also referred to as “Alice”), desiring to transact with second user **104** (also referred to as “Bob”). Connections between various components in system **100** may be implemented through known data transfer systems, such as encrypted data transfer, wired or wireless communication protocols, and various Application Programming Interface (API) call protocols known in the art.
[0016] First user **102** is shown having an associated first device **106** and second user **104** is shown having an associated second device **108**. Associated first device **106** may include one or more computing devices that store information about a plurality of digital assets owned by first user **102**. For example, first user **102** may have a Metamask wallet for holding ETH, a Coinbase PRIME account for holding BTC, and a Trust Wallet for holding SOL. Thus, associated first device **106** is shown including a first digital asset **110**, a second digital asset **112**, and a third digital asset **114**. However, more or fewer digital assets may be owned by a given user without departing from scope

hereof. Each digital asset may be digital currencies, tokens, or other type of digital asset. Each digital asset may be digital currencies or tokens of the same type (e.g., two bitcoin wallets owned by a given user), or may be of different types. Examples of digital currencies include Bitcoin, Ethereum, Matic, BNB, Sol, or USDC. Examples of tokens can include NFTs, tokenized securities, tokenized bonds, tokenized carbon credits, tokenized intellectual property, or other representations of real-world assets or financial instruments. Examples of physical assets include real estate title, property leases, car titles, license agreements (both tangible and intangible), tokenized treasuries, tokenized corporate bonds or securities, and physical art. Examples of intangible assets include patents, copyrights, trade marks, and trade secrets. Thus, the term "digital asset" used herein encompasses digital assets and digital representations of a physical or other tangible asset.

[0017] Associated first device **106** further includes one or more first-user parameters **116**. One or more first-user parameters **116** may define user-set configuration regarding a given digital asset (e.g., one or more of digital assets **110**-**114**). For example, in a case where one or more digital assets represents a real-world physical asset, first user **102** may desire to set a maximum or minimum value that the digital asset represents. In another example, first user **102** may force rank the digital assets **110**-**114** in order of fungibility **116** for a desired transaction. In yet a further example, first user **102** may include unique meta-data for a particular digital asset (e.g. autographed picture of Steph Curry associated with a basketball NFT) as part of the first-user parameters **116**.

[0018] Associated second device **108** may include one or more computing devices that store information about a plurality of digital assets owned by second user **104**. For example, associated second device **108** is shown including a first digital asset **120**, a second digital asset **122**, and a third digital asset **124**. However, more or fewer digital assets may be owned by a given user without departing from scope hereof. Each digital asset may be of the same type (e.g., two bitcoin wallets owned by a given user), or may be of different types. Examples of digital currencies include Bitcoin, Ethereum, Matic, BNB, Sol, or USDC. Examples of tokens can include NFTs, tokenized securities, tokenized bonds, tokenized carbon credits, tokenized intellectual property, or other representations of real-world assets or financial instruments. Examples of physical assets include real estate title, property leases, car titles, license agreements (both tangible and intangible), tokenized treasuries, tokenized corporate bonds or securities, and physical art. Examples of intangible assets include patents, copyrights, trademarks, and trade secrets.

[0019] Each "digital asset" block in FIG. **1** not only represents data defining the given digital asset, but also a definition of the necessary information to identify and/or confirm transactions based on the given digital asset. This information may include the wallet address, public key of the user. private key of the user, geolocation, KYC or KYT ("know-your-token") compliance history for a given digital asset, or the amount of a particular digital asset.

[0020] Associated second device **108** further includes one or more second-user parameters **126**. One or more second-user parameters **126** may define user-set configuration regarding a given digital asset (e.g., one or more of digital assets **120**-**124**). For example, in a case where one or more digital assets represents a real-world physical asset, second user **104** may desire to set a maximum or minimum value that the digital asset represents. In another example, second user **104** may indicate what digital assets are more desirable or least desirable **126** for a given transaction.

[0021] System **100** further includes a transaction optimizer device **130**. Transaction optimizer device **130** may include a first data storage system **131** and associated processing system located on a mobile device, laptop, desktop, hardware wallet, USB drive, hard-drive, or cloud server. In an embodiment, the first data storage system **131** is hosted on a software application designed for use on mobile devices. The software application can be a mobile application (e.g. iOS or Android mobile app) or part of the mobile device firmware (e.g. Solana phone). In an additional or alternative embodiment, the first data storage system **131** can be hosted on-prem (e.g. laptop or desktop or server) or cloud server (e.g. AWS, Azure). An example mobile application is Metamask or Coinbase Wallet. An example cloud server is Coinbase PRIME.

[0022] As such, transaction optimizer device **130** may represent an intelligent computing system implementing artificial intelligence and/or smart contracts to implement a transaction **101** between first user **102** and second user **104**. First user **102** and second user **104** may each register with transaction optimizer device **130**. Once registered, data regarding each digital asset owned (or desired to be transacted with using transaction facilitation module **130**) is transmitted from the respective associated first device **106** and associated second device **108** to, and received by, transaction optimizer device **130**. Data received from first device **106** is stored as first-user asset-set definition **132**. Data received from second device **108** is stored as second-user asset-set definition **134**. In embodiments, first-user asset-set definition **132** and second-user asset-set definition **134** may include the actual digital assets owned by each of first user **102** and second user **104**, or may include just a description of the assets (e.g., necessary identifiers, and current valuations thereof). Therefore, transaction optimizer device **130** may serve as a custodian of the digital assets, or may serve simply as an agent defining available assets for one or more transactions between first user **102** and second user **104**.
[0023] Although shown as a single block in FIG. **1**, transaction optimizer device **130** may be distributed across a plurality of data storage devices (such as a distributed cloud-computing system) where one or more first data storage system **131** custodies a single type of digital asset each (e.g. BTC in one first data storage system, ETH in another first data storage system). In this case, each first data storage system **131** acts as a separate custodian.
[0024] Transaction optimizer device **130** includes a transaction optimizer module **136**. Additionally or alternatively, transaction optimizer module **136** may reside on one or both of associated first device **106** and associated second device **108** to allow respective user device to respond to a transaction request from the other user device with an optimal blend of digital assets owned by the user.
[0025] Transaction optimizer module **136** determines an optimal combination of each user's digital assets (e.g., digital currencies or tokens) for a transaction based on a set of factors or selection criteria. One example factor includes the type and value of digital currencies or tokens as defined by first-user asset-set definition **132** and second-user asset-set definition **134** in the data storage system **131**. Another example factor includes the value of goods or services involved in the transaction which are either based on real-world current market value as received by transaction optimizer device **130** from a third-party market valuator (which may be readily available through a third party such as a Kelly Blue Book for vehicles, real-time digital currency or token exchange data, or not readily available such as an IP monetary evaluation requested such as by a third-party IP evaluator) or based on user-set valuations such as defined in one or more first-user parameters **116** and/or one or more second-user parameters **126**. Another example factor includes first user **102** and second user **104** past purchasing history, investment risk profile, or other historical data (shown stored as first user history **138** and second user history **140**.
[0026] To initiate a transaction, one or both of first user **102** and second user **104** may interact with a user interface on associated first device **106** and associated second device **108**, respectively, and transmit a definition of an asset to be sold within the transaction. This may be an active request to initiate the transaction, or there may be automatic transaction settings defined by first user **102** and/or second user **104** (and defined within one or more first-user parameters **116** and one or more second-user parameters **126**, respectively) to allow for automatic transactions to be processed by transaction optimizer device **130**.
[0027] Transaction optimizer device **130** receives parameters of a first side of the transaction, and then processes the information associated with first-user asset-set definition **132** and second-user asset-set definition **134** to determine the optimal combination of digital assets between first user **102** and second user **104** to complete for the transaction (referred to herein as transaction optimization **142**). For example, to initiate transaction optimization **142**, first user **101** (acting as a payee in a given transaction in this example) may interact with user interface **150**. Said interaction

is relayed to transaction optimizer module **136** which in turn defines at least one selection criteria for the transaction optimizer module **136** to consider when generating transaction optimization **142**. The selection criteria can include, for example: the type of cryptocurrency, gain to one or more parties from the transfer of a digital asset, loss to one or more parties from the transfer of a digital asset, and request of a certain digital asset from another party. Other selection criteria are possible including: least favorite digital asset stored in the first data storage system, most favorite digital asset stored in the first data storage system, interest bearing digital assets stored in the first data storage system, and type of digital asset stored in the first data storage system (e.g. patent, real estate title, loan). Advantageously, in at least one embodiment, transaction optimizer device **130** does not actually process the transaction, thereby eliminating various security and financial compliance requirements to implement transaction optimizer device **130**. Instead, transaction optimization **142** may be transmitted to one or both of associated first device **106** and associated second device **108** for acceptance, refusal, or counter thereof. Once accepted, each associated first device **106** may implement the parameters defined by transaction optimization **142**, and send confirmation to either the other of associated first device **106** or associated second device **108**, or to transaction optimizer device **130** for close of escrow of the transaction optimization **142**. In addition, in at least one embodiment, transaction optimizer device **130** considers the regulatory designation of each digital asset and tax implications of the contemplated transaction, and will flag a potential combination as being out-of-compliance.

[0028] Alternatively, in embodiments where the actual digital assets are transferred from associated first device **106** and associated second device **108** to transaction optimizer device **130**, the transaction optimizer device **130** may transmit the transaction optimization **142** to each associated first device **106** and associated second device **108**, and then receive official approval from each respective first user **102** and second user **104**, and then complete the transaction and transfer the transacted digital assets to each associated first device **106** and associated second device **108**, respectively.

[0029] In this alternate embodiment, the digital assets remain on the one or more first data storage system **131** of transaction optimizer device **130** until transferred to one or more second data storage systems (e.g., associated first device **106** and associated second device **108** or an agent(s) thereof). The one or more first data storage system **131** of transaction optimizer device **130** may send to the one or more second data storage system (or an agent of the one or more second data storage system) the type optimal combination. The one or more second data storage system (or agent thereof) may accept, reject, or counter the type optimal combination, whereby the transaction optimizer device **130** may receive such acceptance, rejection or counter. If accepted, the transaction optimizer device **130** will instruct its one or more first data storage system **131** to instruct the transfer of the digital assets of first user first user **102** and/or second user second user **104** to the one or more second data storage system according to a schedule defined in the transaction optimization **142**. If the initial transaction optimization **142** is countered by one or more of first user **102** and second user **104**, transaction optimizer device **130** can either accept or reject the counteroffer, thus repeating the above steps. In this alternative embodiment, data storage system could be a custodial account storage (e.g. Coinbase PRIME) that custodies the various digital assets OR a self-custodial account (e.g. Metamask) that hosts the information needed for the transaction optimization.

[0030] In embodiments, acceptance, rejection, or counter of an initial transaction optimization **142** presented to first user **102** and/or second user **104** may be manually completed via user first user **102** interacting with a user interface **150** on associated first device **106**, and/or second user **104** interacting with a user interface **152** on associated second device **108**. User interface **150** and user interface **152** may be an input/output (e.g., touchscreen, mouse/keyboard, etc.) and associated human-readable data transmission (e.g., display, microphone, etc.) device.

[0031] The agent in the foregoing example could be a separate intelligent computing system, a

digital asset custodian (e.g. Coinbase), a hardware wallet, a mobile device wallet, or other software system that is able to receive the type optimal combination and send data back to the intelligent computing system. Further, the agent could be a separate module within transaction optimizer device **130**. For example, if the transfer involves the same custodian on both sides (e.g. sending from one Coinbase account to another Coinbase account), the custodian could use the same transaction optimizer device **130**.

[0032] Within system **100**, in some embodiments, transaction optimizer device **130** is located on a device that also includes the one or more first data storage system **131** that stores first-user asset-set definition **132** second-user asset-set definition **134** and stores and executes transaction optimizer module **136**. Further, the intelligent computing system may be distributed across the one or more first data storage system **131**. For example, each first data storage system may contain logic that, when acting in concert, comprises the intelligent computing system. This device can include a mobile device, laptop, hardware wallet, hard-drive, desktop, or cloud server. For example, in a mobile device the one or more first data storage system can reside in memory on the mobile device whereby the intelligent computing system is located on a processor. In other embodiments, transaction optimizer device **130** and the one or more first data storage system **131** are separate. For example, the one or more first data storage system may reside on a mobile device where the intelligent computing system resides on a cloud server that is in data communication with the mobile device. This latter example may be relevant when the digital currencies or tokens are with a third-party custodian, and a payer just holds a representation of the digital currencies or tokens on their mobile device application.

[0033] In certain embodiments, transaction optimizer device **130** may utilize an orchestration layer coupled to the one or more first data storage system **131** to coordinate the transfer of one or more digital assets when transaction optimization **142** is accepted by each party to the transaction. The orchestration layer acts as a digital protocol bridge when the digital currencies or tokens operate on different blockchain networks or blockchain protocols. For example, a user may have a Metamask wallet for holding ETH, a Coinbase PRIME account for holding BTC, and a Trust Wallet for holding SOL. The orchestration layer would receive instructions from the transaction optimizer device **130** (e.g., from transaction optimizer module **136**) related to the type optimal combination of digital currencies or tokens for the transaction. The orchestration layer would then instruct each of the first data storage systems to transfer the specific digital asset held in each first data storage system to one or more second data storage systems according to the digital currency type or blockchain network protocol. The orchestration layer can be included in the transaction optimizer device **130** as, for example, a software layer or can be a separate software component (which may or may not be a component of transaction optimizer module **136**). If separate, the transaction optimizer device **130** and orchestration layer may communicate via API. In a non-limiting embodiment, the one or more second data storage system may be coupled to a separate orchestration layer for receiving the transaction from the one or more first data storage system. An example orchestration layer is found in U.S. Pat. No. 11,651,353 herein incorporated by reference in its entirety.

[0034] In some embodiments, specific transactions and transfers according to transaction optimization **142** occur using a decentralized digital ledger system. A decentralized ledger system can include the Bitcoin network, Ethereum network, Polygon, Solana, and Avalanche. In other embodiments, the transaction occurs using a centralized system where the computing nodes effectuating the transaction reside in a central location (e.g. cloud, on-prem).

[0035] In some embodiments, transaction optimizer module **136** uses geolocation as a factor, data received from the first data storage system, or data related to the second data storage system to determine where a payer and payee are located. For example, one or more first data storage system **131** may store first-user location **160** and second-user location **162**. First-user location **160** may be transmitted periodically, or on request during initiation of transaction optimization **142**, from

associated first device **106** to transaction optimizer device **130** to identify current location of first user **102**. Second-user location **162** may be transmitted periodically, or on request during initiation of transaction optimization **142**, from associated first device **106** to transaction optimizer device **130** to identify current location of second user **104**. Geolocation is helpful when the payer and payee are located in different jurisdictions when the transaction **101** takes place, or the payer is not present in their home jurisdiction during the transaction **101**. For example, certain digital assets (e.g. BAYC NFT) may have a higher value in one jurisdiction compared to the other. Thus, transaction optimizer device **130** can play arbitrage between the digital assets custodied in the first data storage system **131** and what the payee is willing to accept.

[0036] It should be appreciated that a variety of other factors may be used with regards to generate transaction optimization **142**, such as geolocation of the parties to the transactions, party credit rating, or party selection criteria (e.g., one or more first-user parameters **116** or one or more second-user parameters **126**).

[0037] The above description of system **100** enables a computer-implemented a system and method for optimizing digital asset transactions. The system and method may include custodying digital currencies or tokens in one or more first data storage system. Custodying can be either self-custody (e.g. Metamask wallet) or via a custodian (e.g. Coinbase PRIME) or a combination. For example, a user may have a Metamask wallet for holding ETH, a Coinbase PRIME account for holding BTC, and a Trust Wallet for holding SOL. The system and method may optimize the transactions from one or a combination of these first data storage systems. Further, the one or more first data storage system can be on a mobile device, laptop, desktop, hardware wallet, USB drive, hard-drive, or cloud server. Also, the one or more first data storage system may custody a representation of the digital currencies or tokens, whereby the actual digital currencies or tokens reside in one or more separate storage location (e.g. cold storage). For example, a mobile device may use Coinbase PRIME to hold a representation of the digital currency, whereby the actual digital currency resides on the Coinbase server hosted by Coinbase. In another example, the digital currency may be physically stored on a Bitkey hardware wallet but a representation held on the Bitkey mobile app. The above discussed system and method embody actual custody, self-custody, representative custody, or a combination, and in no way should be limited to just one type of custody.

[0038] The various functionality discussed herein may, in some embodiments, be implemented using a non-transitory computer-readable medium stores instructions that, when executed by a computer, cause the computer to perform the functions for optimizing digital asset transactions discussed herein. The method includes receiving data from a first data storage system, determining an optimal combination of digital currencies or tokens for the transaction based on a set of factors, and sending to the first data storage system the type optimal combination of digital currencies or tokens for the transaction.

[0039] In a non-limiting example, first user **102** selects four types of digital assets to be transferred to second user **104**. Information **132** regarding the four types of digital assets is transmitted to transaction optimizer device **130**, which includes origin history associated with a NFT. Second user **104** transmits its information **134** to the transaction optimizer requesting certain digital assets, however, the information **134** doesn't contain any compliance information regarding the types of digital assets **104** can accept. Transaction optimizer **130** knows the location of second user **104** and recognizes that second user **104** cannot receive at least one of the contemplated digital assets because second user's **104** country of residence doesn't permit that type of digital asset, thus rejecting the transaction. Further, transaction optimizer **130** suggests a different combination of digital assets to both first user **102** and second user **104**, where the different combination of digital assets would be in compliance and satisfy the user criteria **132** and **134**. First user **102** completes the optimized transaction by transferring the digital assets from first-user's Coinbase wallet **106** to second-user's Trust Wallet **108**.

[0040] In a further non-limiting example, first user **102** selects four types of digital assets to be

transferred to second user **104**. Information **132** regarding the four types of digital assets is transmitted to transaction optimizer **130**, which includes information regarding maximizing net-capital gain with the transaction. Second user **104** transmits its information **134** to the transaction optimizer **130**, which includes a desirability indicator for a specific digital asset. Transaction optimizer **130** recognizes that the desired digital asset is not part of the contemplated transaction but that first user **102** has such digital asset on its first device **106**. Transaction optimizer alerts first user **102** that second user **104** desires a particular digital asset, which could still maximize the net-gain to the first user **102**. First user **102** can either "accept" the proposal from the transaction optimizer or "reject" (and, optionally, provide a reason) and select another digital asset for the transaction. Here, first user **102** accepts the proposal and transfers the digital assets from first user's Coinbase PRIME account **106** to second-user's Coinbase wallet **108**.

[0041] In yet another non-limiting example, first user **102** selects four types of digital assets to be transferred to second user **104**. The transaction optimizer **130** recognizes that one of the digital assets was previously associated with a company on the United States' sanction list (via information received from third-party evaluator **140** or other third party data source, for example) and rejects the desired transaction. Further, transaction optimizer **130** suggests an alternative, optimal combination of digital assets for the transaction that is both in compliance and satisfies any user defined criteria **132** and/or **134**. Transaction optimizer also alerts user **102** that one of its digital assets may be out of compliance. First user **102** accepts the alternative combination and transfers the digital assets from its Coinbase PRIME account **106** to second-user's Coinbase PRIME account **108**.

[0042] In yet a further non-limiting example, first user **102** selects four types of digital assets to be transferred to a second user **104** and includes information **132** regarding optimizing tax withholdings with the transfer. Second user **104** doesn't submit any criteria **134** regarding the transfer. Transaction optimizer **130**, having access to second device **108**, recognizes that second user would receive a tax benefit if it received a majority of one type of digital asset contemplated as part of the transfer and alerts second user **104** of the tax advantage. Second user **104** submits a counter-proposal to transaction optimizer **130**, which then suggests a type-optimal combination of digital assets that maximizes the tax advantage for both first user **102** and second user **104**. First user **102** accepts the type-optimal combination and transfers the digital assets from its self-custody wallet **106** to second user's Coinbase PRIME account **108**.

[0043] In another non-limiting example, first user **102** selects four types of digital assets from four different storage devices **106**A, **106**B, **106**C, and **106**D to be transferred to second user **104**. First user includes information **132** for each of the four types of digital assets, which information desires to maximize capital gains on digital assets 1-3 and liquidate all of first user's **102** holdings of digital asset 4. Second user **104** submits information **134** regarding maximizing taxes with the receipt of the digital assets and that each digital asset should be placed in specific wallets **108**A, **108**B, **108**C, and **108**D. Given the complexity of the wallet-to-wallet transfers, transaction optimizer utilizes an orchestration layer to more efficiently move the assets from first user's **102** wallets to second user's **104** wallets. Transaction optimizer suggests the type-optimal transaction given the user criteria **132** and **134**, utilizes the orchestration layer to effectuate the transfers as follows: Digital Asset #1 from **106**A to **108**D; Digital Asset #2 from **106**B to **108**C; Digital Asset #3 from **106**C to **108**B; and Digital Asset #4 from **106**D to **108**A.

[0044] In each of the non-limiting examples, the transaction optimizer **130**, learns the transaction behavior of the first user **102** and second user **104** through the user defined criteria. Transaction optimizer **130** can apply these learnings on the current transaction or future transaction involving either first user **102** or second user **104**. Further, transaction optimizer takes these learnings from the users and combines them with one or more set of factors: type and value of the digital assets in the data storage system, the value of goods or services to be purchased, user past purchasing history, geo-location of a user, compliance history of a particular digital asset, tax implications

associated with a digital asset, and real-time digital currency or token exchange data. This iterative process allows transaction optimizer **130** to be more efficient over time.

[0045] FIG. **2** is a flow diagram of an example method **200** of optimizing digital asset transactions using an artificial intelligence engine in a digital asset wallet in accordance with certain embodiments described herein. Method **200** may be implemented using system **100** described above.

[0046] The method **200** comprises holding in a digital asset wallet different digital assets in an operational block **202**. In one example of operation, each of associated first device **106** and associated second device **108** hold one or more digital assets **110**, **112**, **114**, or **120**, **122**, **124**, respectively. Additionally, or alternatively, an example of operational block **202** may include transmitting the digital assets or a description/data regarding said digital assets to transaction optimizer device **130** as first-user asset-set definition **132** or second-user asset-set definition **134**.

[0047] The method **200** further comprises incorporating an artificial intelligence engine into the digital asset wallet in an operational block **204**. In on example of operation of block **204**, transaction optimizer module **136** is incorporated into one or more first data storage system **131**. Additionally, or alternatively, transaction optimizer module **136** may reside on one or both of associated first device **106** and associated second device **108** to allow respective user device to respond to a transaction request from the other user device with an optimal blend of digital assets owned by the user.

[0048] The method **200** further comprises using the artificial intelligence engine to determine the best combination of digital assets for the digital asset transaction based on inputs from the payor and payee in operational blocks **206**. In one example of operation of block **206**, transaction optimizer module **136** generates transaction optimization **142** based on an analysis of the digital assets as defined by the digital assets themselves, or a data representation thereof such as first-user asset-set definition **132** or second-user asset-set definition **134**. Moreover, additional factors may be utilized to generate the best combination, such as geolocation of the parties (e.g., first-user location **160** and/or second-user location **162**) to the transactions, party credit rating, or party selection criteria (e.g., one or more first-user parameters **116** or one or more second-user parameters **126**).

[0049] The method **200** further comprises sending from the artificial intelligence engine into the digital asset wallet the best combination of digital assets for the digital asset transaction in an operational block **208**. In one example of operation, transaction optimization **142** is transmitted from transaction optimizer device **130** to one or both of associated first device **106** and associated second device **108**. Each user first user **102** and second user **104** may then accept, counter, or reject the parameters of the transaction defined in transaction optimization **142**.

[0050] The method **200** further comprises sending with the digital asset wallet the best combination of digital assets to the payee's wallet or other account in an operational block **210**. In one example of operation of block **210**, transaction optimizer device **130** custodies and implements the transaction parameters in an accepted transaction between first user **102** and second user **104**. In another example of operation of operational block **210**, each associated first device **106** and associated second device **108** are used to implement the parameters within transaction optimization **142**, and confirmation of the completed transactions are sent to transaction optimizer device **130** for close of escrow enabled by transaction optimizer device **130**.

[0051] Changes may be made in the above methods and systems without departing from the scope hereof. It should thus be noted that the matter contained in the above description or shown in the accompanying drawings should be interpreted as illustrative and not in a limiting sense. The following claims are intended to cover all generic and specific features described herein, as well as all statements of the scope of the present method and system, which, as a matter of language, might be said to fall therebetween.

Claims

1. A computer-implemented method for optimizing digital asset transactions, comprising: custodying in one or more first data storage system digital assets; determining with a transaction optimizer module of an intelligent computing system an optimal combination of digital assets for a transaction based on a set of factors; receiving from the intelligent computing system into the one or more first data storage system the optimal combination digital assets for the transaction; and sending with the one or more first data storage system the optimal combination of digital assets to one or more second data storage system.
2. The method of claim 1, wherein the intelligent computing system is located on a device that also includes the one or more first data storage system.
3. The method of claim 1, wherein the set of factors is selected from the group consisting of: the type and value of the digital assets in the data storage system, the value of goods or services to be purchased, user past purchasing history, geo-location of a user, compliance history of a particular digital asset, tax implications associated with a digital asset, and real-time digital currency or token exchange data.
4. The method of claim 1, wherein the one or more first data storage system custodies multiple digital currencies or tokens.
5. The method of claim 4, wherein the digital currencies or tokens include cryptocurrency, non-fungible tokens, and digital representations of physical or intangible assets.
6. The method of claim 1, wherein the transaction occurs using a decentralized digital ledger system.
7. The method of claim 1, wherein the intelligent computing system uses geolocation to determine where a payer and payee are located.
8. The method of claim 1, the determining the optimal combination including accounting for at least one user-defined selection criteria regarding the transaction, the at least one selection criteria is selected from the group consisting of: the type of cryptocurrency, gain to one or more parties from transfer of a digital asset, loss to one or more parties from transfer of a digital asset, and request of a certain digital asset from another party.
9. The method of claim 1, wherein the intelligent computing system receives an acceptance, rejection, or counter from the one or more second data storage system or agent thereof.
10. The method of claim 9, wherein the intelligent computing system receives an acceptance from the one or more second data storage system or agent thereof and instructs the one or more first data storage system to send the optimal combination of digital currencies or tokens to the one or more second data storage system.
11. A system for optimizing digital asset transactions, comprising: one or more first data storage system for custodying digital assets; an intelligent computing system that uses data from the one or more first data storage system, wherein the data includes description of the digital assets stored in the one or more first data storage system; and an optimal combination of digital assets for the transaction based on a set of factors considered by the intelligent computing system, wherein the one or more first data storage system is configured to send to one or more second data storage system the optimal combination of digital currencies or tokens.
12. The system of claim 11, wherein the intelligent computing system is located on a device that also includes the one or more first data storage system.
13. The system of claim 11, wherein the set of factors includes the type and value of digital assets in the data storage system, the value of goods or services to be purchased, a payer's and payee's past purchasing history, geo-location of a user, compliance history of a particular digital asset, tax implications associated with a digital asset, and real-time digital currency or token exchange data.
14. The system of claim 11, wherein the digital assets include cryptocurrency, non-fungible tokens,

and digital representations of physical or intangible assets.
15. The system of one of claim 11, wherein the transaction occurs using a decentralized digital ledger system.
16. The system of one of claim 11, wherein the intelligent computing system uses geolocation to determine where parties to the transaction are located.
17. The system of one of claim 11, wherein a user selects at least one user-defined selection criteria regarding the transaction, the at least one selection criteria is selected from the group consisting of: the type of cryptocurrency, gain to one or more parties from transfer of a digital asset, loss to one or more parties from transfer of a digital asset, and request of a certain digital asset from another party.
18. The system of one of claim 11, wherein the intelligent computing system processes an acceptance, rejection, or counter from the one or more second data storage system or agent thereof.
19. The system of claim 18, wherein the intelligent computing system processes an acceptance from the one or more second data storage system or agent thereof and instructs the one or more first data storage system to send the optimal combination of digital currencies or tokens to the one or more second data storage system.
20. The system of claim 19, wherein the intelligent computing system processes a counter combination of digital assets from the one or more second data storage system or agent thereof.
21. A non-transitory computer-readable medium storing instructions that, when executed by a computer, cause the computer to perform a method for optimizing digital asset transactions, the method comprising: receiving data from one or more first data storage system, wherein the data includes the type of digital currencies or tokens stored in the one or more first data storage system; determining an optimal combination of digital currencies or tokens for the transaction based on a set of factors; and sending to the one or more first data storage system the type optimal combination of digital currencies or tokens for the transaction.