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Dynamic Card Art Service

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“DYNAMIC CARD ART SERVICE”

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TECHNICAL FIELD

[0001] The present subject matter is, in general, related to the field of digital financial transactions, and particularly, but not exclusively to a system and method for displaying dynamic card art to a cardholder and allowing the cardholder to securely interact with the dynamic card art to make transaction preferences and/or decisions during a digital financial transaction.

BACKGROUND

[0002] Digital transaction instrument(s) and digital channel(s) are currently being used around the world for performing online financial transactions. Examples of such instrument(s) and channel(s) include, but are not limited to, digital payment cards, digital wallets, and mobile banking applications. Likewise, the use of computing devices, such as mobile or portable computing devices in conducting financial transactions is becoming widespread.

[0003] While making an online transaction, financial transaction merchants as well as payment service providers (PSPs) may traditionally display, to a cardholder, a representation or a facsimile of a physical payment card with static card information on a display screen of the computing device. Such static card information may include information pertaining to the account of the cardholder, such as product type, expiry date, last 4 digits of the account number, in the form of static card art. However, the static card art, displayed to the cardholder, does not provide contextual information related to the subject transaction. The contextual information may include any prompt or warning symbols, for example, representation of any restrictions on use of the card in context of the subject transaction. The contextual information may also include benefits or offers which can be availed by the cardholder through the card in the context of the transaction, such as, lowest monthly instalment amount for the subject transaction. Additionally, the static card art does not allow the cardholder to interact with the static card information displayed on the card.

[0004] In general, financial transaction merchants and PSPs contact Content Management Systems (CMS) in order to fetch a card art, or other digital assets. However, such CMSs store static images and does not have the ability to connect to a specialized set of data repositories for sourcing additional meta-data related to the transactional context. Therefore, CMSs does not have the capability to utilize the static image and customize the same to add visual contextual indicators in accordance with the context of a subject transaction. In addition, the

static card art does not allow the cardholder to interact with any information to make real-time payment preference(s) and/or decision(s).

[0005] Therefore, there is a need for a dynamic card art service which can customize the card art dependent on the payment transaction context and provide additional contextual information, such as warning symbols and benefits or offers which can be availed and interacted with, for the purposes of making payment preferences and/or decisions by the cardholder.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] The accompanying drawings, which are incorporated in and constitute a part of this disclosure, illustrate exemplary embodiments and, together with the description, explain the disclosed principles. In the figures, the left-most digit(s) of a reference number identifies the figure in which the reference number first appears. The same numbers are used throughout the figures to reference like features and components. Some embodiments of device or system and/or methods in accordance with embodiments of the present subject matter are now described, by way of example only, and with reference to the accompanying figures, in which:

[0007] **FIG. 1** illustrates an exemplary environment of a system for implementing a dynamic card art service, in accordance with some embodiments of the present disclosure;

[0008] **FIG. 2** illustrates a schematic flow diagram indicating a method for enabling a dynamic card art service, in accordance with some embodiments of the present disclosure; and

[0009] **FIG. 3** is a block diagram of an exemplary computer system for implementing embodiments consistent with the present disclosure.

[0010] The figures depict embodiments of the disclosure for purposes of illustration only. One skilled in the art will readily recognize from the following description that alternative embodiments of the structures and methods illustrated herein may be employed without departing from the principles of the disclosure described herein.

DESCRIPTION OF THE DISCLOSURE

[0011] It is to be understood that the present disclosure may assume various alternative variations and step sequences, except where expressly specified to the contrary. It is also to be

understood that the specific devices and processes illustrated in the attached drawings and described in the following specification are simply exemplary and non-limiting embodiments or aspects. Hence, specific dimensions and other physical characteristics related to the embodiments or aspects disclosed herein are not to be considered as limiting.

[0012] In the present document, the word "exemplary" is used herein to mean "serving as an example, instance, or illustration." Any embodiment or implementation of the present subject matter described herein as "exemplary" is not necessarily to be construed as preferred or advantageous over other embodiments.

[0013] While the disclosure is susceptible to various modifications and alternative forms, specific embodiment thereof has been shown by way of example in the drawings and will be described in detail below. It should be understood, however, that it is not intended to limit the disclosure to the particular forms disclosed, but on the contrary, the disclosure is to cover all modifications, equivalents, and alternative falling within the spirit and the scope of the disclosure.

[0014] The terms “comprises”, “comprising”, or any other variations thereof, are intended to cover a non-exclusive inclusion, such that a setup, device or method that comprises a list of components or steps does not include only those components or steps but may include other components or steps not expressly listed or inherent to such setup or device or method. In other words, one or more elements in a device or system or apparatus proceeded by “comprises… a” does not, without more constraints, preclude the existence of other elements or additional elements in the device or system or apparatus.

[0015] The terms "an embodiment", "embodiment", "embodiments", "the embodiment", "the embodiments", "one or more embodiments", "some embodiments", and "one embodiment" mean "one or more (but not all) embodiments of the invention(s)" unless expressly specified otherwise.

[0016] The terms "including", "comprising", “having” and variations thereof mean "including but not limited to" unless expressly specified otherwise.

[0017] As used herein, the terms “communication” and “communicate” may refer to the reception, receipt, transmission, transfer, provision, and/or the like of information (e.g., data, signals, messages, instructions, commands, and/or the like). For one unit (e.g., a device, a

system, a component of a device or system, combinations thereof, and/or the like) to be in communication with another unit means that the one unit is able to directly or indirectly receive information from and/or transmit information to the other unit. This may refer to a direct or indirect connection (e.g., a direct communication connection, an indirect communication connection, and/or the like) that is wired and/or wireless in nature. Additionally, two units may be in communication with each other even though the information transmitted may be modified, processed, relayed, and/or routed between the first and second unit. For example, a first unit may be in communication with a second unit even though the first unit passively receives information and does not actively transmit information to the second unit. As another example, a first unit may be in communication with a second unit if at least one intermediary unit (e.g., a third unit located between the first unit and the second unit) processes information received from the first unit and communicates the processed information to the second unit. In some non-limiting embodiments, a message may refer to a network packet (e.g., a data packet and/or the like) that includes data. It will be appreciated that numerous other arrangements are possible.

[0018] As used herein, the term “computing device” may refer to one or more electronic devices that are configured to communicate with directly or indirectly or over one or more networks. A computing device may be a mobile or portable computing device, a desktop computer, a server, and/or the like. Furthermore, the term “computer” may refer to any computing device that includes the necessary components to receive, process, and output data, and normally includes a display, a processor, a memory, an input device, and a network interface. A “computing system” may include one or more computing devices or computers.

[0019] As used herein, the term “application” or “Application Program Interface” (API) may refer to computer code or other data sorted on a computer-readable medium that may be executed by a processor to facilitate the interaction between software components, such as a client-side front-end and/or server-side back-end for receiving data from the client. An “interface” refers to a generated display, such as one or more graphical user interfaces (GUIs) with which a user may interact, either directly or indirectly (e.g., through a keyboard, mouse, touchscreen, etc.). Further, multiple computers, e.g., servers, or other computerized devices, such as an autonomous vehicle including a vehicle computing system, directly or indirectly communicating in the network environment may constitute a “system” or a “computing system”.

[0020] As used herein, the term "device" or "mobile device" may refer to any electronic device that may be transported and operated by a user, which may also provide remote communication capabilities to a network. Examples of remote communication capabilities include using a mobile phone (wireless) network, wireless data network (e.g., 3G, 4G or similar networks), Wi-Fi, Wi-Max, or any other communication medium that may provide access to a network such as the Internet or a private network. Examples of mobile devices include mobile phones (e.g., cellular phones), PDAs, tablet computers, netbooks, laptop computers, personal music players, hand-held specialized readers, wearable devices (e.g., watches), vehicles (e.g., cars), etc. A mobile device may comprise any suitable hardware and software for performing such functions and may also include multiple devices or components (e.g., when a device has remote access to a network by tethering to another device - i.e., using the other device as a relay - both devices taken together may be considered a single mobile device).

[0021] As used herein, the term "server" may refer to or include one or more computing devices that are operated by or facilitate communication and processing for multiple parties in a network environment, such as the internet, although it will be appreciated that communication may be facilitated over one or more public or private network environments and that various other arrangements are possible. Further, multiple computing devices (for example, servers, POS devices, mobile devices, and so on) directly or indirectly communicating in the network environment may constitute a "system." Reference to "a server" or "a processor," as used herein, may refer to a previously recited server and/or processor that is recited as performing a previous step or function, a different server and/or processor, and/or a combination of servers and/or processors. For example, as used in the specification and the claims, a first server and/or a first processor that is recited as performing a first step or function may refer to the same or different server and/or a processor recited as performing a second step or function.

[0022] **FIG. 1** illustrates an exemplary environment 100 of a system for enabling a dynamic card art service, in accordance with some embodiments of the present disclosure.

[0023] As shown in FIG. 1, the system for enabling a dynamic card art service may be implemented in an environment 100 comprising, without limiting to, a dynamic card art platform 100A, a user 102, a user device 104, a click to pay (CTP) client 106, and a merchant 108 communicatively coupled via a network. In an embodiment, the merchant 108 may be a merchant device. In another embodiment, the merchant 108 may be a merchant software

module or a merchant API. The dynamic card art platform 100A comprises a gateway 110, an orchestrator 112, a query parser 114 connected to payment account attributes data repositories 116. In one example, the payment account attributes data repositories 116 may be data repositories associated with a payment scheme or network, for example, VISA or Visa net. The payment account attributes data repositories 116 may include a Payment Account Attributes Inquiry database and/or a report database including disparate payment settlements being performed against a subject user payment account.

[0024] The dynamic card art platform 100A further comprises a data acquirer 118, a prompt generator 120, and a text-to-image generator 122. The data acquirer 118 is communicatively configured to interact with one or more data sources 124. The data sources 124 may include a transaction control module 124A, instalment service module 124B, and an issuer 124C. The user 102 may be an individual who has a savings account, and/or current account or any other type of account with the issuer 124C, such as an issuer bank. Further, the user 102 may use bank-issued credentials to perform digital transactions. In an embodiment, the user 102 may be provided with a digital payment card from the issuer bank to perform digital transactions. In different embodiments, the user may also be referred alternatively as a cardholder, an account holder, a customer, or a consumer.

[0025] The user 102 may wish to perform an online transaction using the user device 104. The user device 104 may be a mobile device. In an embodiment, the user device 104 may comprise suitable hardware and software (pre-installed Application (App)) for performing one or more functions and may also include multiple sub-devices or sub-components. The CTP client 106 and the merchant 108 may be associated with the user device 104. In an embodiment, user accessible portals pertaining to the CTP client 106 and the merchant 108 are installed on the user device 104. Further, the user device 104 may include, without limitation, a direct interconnection, a wireless network (for example, using Wireless Application Protocol), the Internet, and the like. As an example, the dynamic card art platform 100A could be a VISA dynamic card art service platform.

[0026] In example embodiments, the different types of digital payment card, hereinafter also referred by “card” for the sake of brevity, can include representation or facsimile of credit cards, debit cards, stored value cards, loyalty cards, identification cards, or any other suitable card representing an account of a user or other information thereon. The digital payment card

may include user account related information, such as username, card expiration, and account identifier, including card number. The digital payment card may also include card type, such as domestic, international, etc.

[0027] In an embodiment, the issuer 124C (also referred hereinafter as an issuer server) is associated with an issuer bank, which is the customer bank that issues, for example, a digital payment card on behalf of the card schemes.

[0028] In an embodiment, the gateway 110 may act as a secure interconnection between the orchestrator 112 and the CTP client 106 along with the merchant 108.

[0029] In an embodiment, the data acquirer 118 may include one or more devices configured to communicate with, and/or facilitate communication between the orchestrator 112 and disparate data sources 124. The data acquirer 118 may include a computing device, such as a server (for example, a single server), a group of servers, and/or other like devices. The server may include one or more computing devices, which are operated by or facilitate communication and processing for multiple parties in a network environment, for example, a single server and/or the Internet.

[0030] In an embodiment, the dynamic card art platform 100A may include one or more devices configured to authenticate cardholder/user information. In an embodiment, the dynamic card art platform 100A may be a dedicated server or may be a cloud-based server.

[0031] In an embodiment, the prompt generator 120 may be interfaced with the orchestrator 112 and configured to generate prompt related to a card art query. The prompt being generated by the prompt generator 120 may include, but are not limited to, warnings related to transactions, indications pertaining to different offers or benefits which can be availed by the user, etc.

[0032] In an embodiment, the text-to-image generator 122 may be interfaced with the orchestrator 112 and configured to receive text related to prompts being processed by the prompt generator 120, via the orchestrator 112. Further, the text-to-image generator 122 may process the received text related to the card art query and convert them to respective images representing appropriate card art. In an embodiment, the text-to-image generator 122 may be trained onto pre-populated data pertaining to card images captioned with the card issuer and

card type, images of numbers captioned with the number, symbols with a caption, and/or conditioning images, such as, combinations of card images containing symbols, numbers with the appropriate caption. In an example, the text-to-image generator 122 may be a trained AI model, such as DALL-E2 for generating images related to input texts.

[0033] In an embodiment, prior to making the digital transaction, the user 102 (cardholder) may set preferences defining permissions for the CTP client 106 and/or merchant 108. Such permission may authorise the CTP client 106 and/or merchant 108 to access certain data items related to the transaction from different data sources 124. In an example, a digital payment card issuer may define interactive area over the digital representation or card art of the user's payment card. The interactive area may define interactive element(s), such as one or more digital buttons or slider. The user 102 may be allowed to interact with such digital buttons or slider to select different options and set preferences related to forthcoming transaction.

[0034] **FIG. 2** illustrates a schematic flow diagram 200 indicating a method for operating a dynamic card art service, in accordance with some embodiments of the present disclosure.

[0035] In an exemplary scenario, the user 102 may use the user device 104 to perform a digital transaction via the CTP client 106 and/or the merchant 108. Flows involved in implementation of the dynamic card art platform 100A include a card art query reception, card art query parsing, card art query validation, relevant data items acquisition, data item evaluation, and card art image generation. In an embodiment, the dynamic card art service is carried out between the user device 104 (and associated CTP client 106 and merchant 108), the dynamic card art platform 100A, including various modules (as explained in detail under the description of FIG. 1 and not disclosed here for the sake of brevity), the payment account attributes data repositories 116, and the disparate data sources.

[0036] In an embodiment, a digital payment card issuer may define interactive area over the digital representation or card art of the user's payment card. The interactive area may define interactive elements, such as digital buttons or slider. The user 102 may be allowed to interact with such digital buttons or slider to select different options and set preferences. The different options and preferences, associated with the interactive area, may be defined by a set of rules. The set of rules are related to individual functions associated with each of the digital buttons or slider. For example, the user 102 may use a dedicated slider to opt or request for an

instalment plan related to the subject transaction. In another example, the user 102 may use another set of sliders to select from different modes of payments for a subject transaction.

[0037] In an embodiment, prior to making the digital transaction, the user 102 (cardholder) may use the interactive elements to set preferences defining permissions for the CTP client 106 and/or merchant 108. Such permission may authorize the CTP client 106 and/or merchant 108 to access certain data items related to the transaction from different data sources 124. Upon the user 102 setting the preferences, the preferences are received by the dynamic card art platform 100A along with other information related to the transaction.

[0038] In an embodiment, at step 202, once the user 102 initiates a digital transaction, using the user device 104 and via the CTP client 106 and/or the merchant 108, a card art query related to the digital transaction is received by the orchestrator 112 from the CTP client 106 and/or the merchant 108, via the gateway 110. The gateway 110 is responsible for authenticating the connection between the user device 104 and the dynamic card art platform 100A before processing the card art query. The card art query may be related to remaining account balance in the user account, remaining credit limit for the user's credit card, currency related information, instalments related queries/information, such as instalment offers, terms, and amount for the subject account. Thereafter, the orchestrator 112 sends the card art query to the query parser 114 for processing.

[0039] In an embodiment, while performing a transaction, the user 102 may use the interactive elements to set or modify, in real-time, preferences related to the transaction. For example, the user 102 may set or modify a specific instalment plan, such as 3 months or 6 months, for the transaction while performing the transaction. In an example, the user 102 may use another set of interactive elements to select from different payment sources and/or payment modes for the subject transaction. Allowing the user 102 to select a preferred payment source and/or payment modes, based on the interaction with the interactive elements, eliminates a requirement for an initial authentication which may be required to perform such selection. Subsequently, such selection is recorded in the user preferences, and, during a final authentication of the transaction, the issuer 124C may refer to the user selection already recorded in the user preference to process the transaction.

[0040] In an example, while performing the transaction, the user 102 may be provided with prompts or warnings with respect to the transaction. For example, the user 102 may be provided with a warning with respect to a particular transaction, stating that, the transaction amount may cause an overdraft related to the user's account. Based on the warning, the user can use an associated interactive element, in real-time, to decline the transaction or, alternatively, choose to instead use their credit account funding source to process the transaction. Based on the interaction of the user 102 with the interactive elements, information pertaining to the interaction and other parameters related to the subject transaction are received by the orchestrator 112. Subsequently, the orchestrator 112 may send the card art query to the query parser 114 for processing.

[0041] At step 204, the query parser 114 breaks down the query into individual data items. Such data items are required for the generation of the dynamic card art. In an embodiment, in the case of the CTP client 106 and the merchant queries, the data items may be related to a transaction amount, card balance, transaction restrictions, etc. In another embodiment, in the case of the merchant queries, the data items may be related to instalment term, instalment plan and offers, and monthly amount related to the subject transaction. The data items may also include user preference(s) based on the user's interaction with the respective interactive elements. Subsequently, the query parser 114, based on the data items requirements, contacts different payment account attributes data repositories 116. in order to contextualise the data items for the subject transaction. Contextualization of the data items allows to determine various conditions, such as whether the transaction amount exceed card balance for a particular payment card type, whether a particular type of transaction is restricted for the current user account, etc.

[0042] Thereafter, at step 206, the orchestrator 112 validates the card art query against client policies. The client policies allow the orchestrator 112 to determine if respective client, such as the CTP client 106 or the merchant 108 involved in the financial transaction, are authorized to receive data items or information related to the user account. In an example, the client policies for each client defines different levels or degrees of authorizations allowing or rejecting an access to a particular type of attribute or information related to the user account. The validation allows the orchestrator 112 to determine whether a requesting party, such as the CTP client 106 or the merchant 108, are authorized to access the requested data items. Upon

successful validation, the orchestrator 112 communicates with the data acquirer 118, in order to fetch the required data items from different external data sources 124.

[0043] At step 208, the data acquirer 118 forwards the data item request to different data sources 124, based on the request. For example, the data acquirer 118 may parse a list of requested data items and determines which external services or data sources 124 to connect to for the respective data item. In an embodiment, the data acquirer 118 may iterate through a list of external services and use a connector layer to connect to each one of the external services to receive the requested data item. In an embodiment, the connector layer may be a gateway instrument which authenticates and authorizes the data acquirer 118 to connect to different external services related to the user financial account, in order to acquire a required data items from the respective external service. In an embodiment, the data acquirer 118 may connect to the transaction control module 124A, which determines which service to activate and deactivate for a particular account type. For example, the transaction control service may be VISA Transaction Control service. In an embodiment, in response to the request the data acquirer 118 return a data item to the orchestrator 112 depicting a Boolean true / false indication in order to indicate whether a service related to the transaction is restricted or not.

[0044] In another embodiment, the data acquirer 118 may connect to the instalment service module 124B, for example Visa Instalment Services, to determine whether an instalment plan can be offered for that card, transaction type, and for the transaction amount. In case an instalment plan can be offered, the data acquirer 118 will receive data item with an instalment term and monthly instalment amount.

[0045] In yet another embodiment, the data acquirer 118 may request to the issuer 124C (also referred hereinafter as an issuer bank) to request a response related to the subject transaction and account status. For example, the data acquirer 118 may connect to the issuer 124C to determine whether the subject transaction amount exceeds the remaining account balance.

[0046] In an embodiment, the data acquirer 118 forwards the data items, related to user preferences based on the user’s interaction, with the respective interactive elements, to one or more of the transaction control module 124A, the instalment service module 124B, and the issuer 124C. In an example, the transaction control module 124A may receive the data items and determine if the requested payment source and/or mode of transaction, indicated as per the user preference, is activated to perform the requested transaction. In another example, the

instalment service module 124B may receive the data items and determine whether a user 102 is eligible for the instalment plan requested as per the user preference. In yet another example, the issuer 124C may receive the data items, and store the transaction parameters into an authorization database. For example, the issuer 124C may store parameters related to the user preferences, which the user provided by interacting with the interactive elements. In an example, the data items stored in the authorization database may allow the issuer 124C to set one time preference(s) or default preference(s) for a particular transaction instance and/or type. The default preference may be provided to the user 102 as a suggestion if the user 102 initiates a subsequent transaction based on the type of the subsequent transaction.

[0047] Thereafter, the orchestrator 112 receives the collected data items from the data acquirer 118, and the orchestrator 112 passes the data items to the prompt generator 120, together with the original query passed in by the client (the CTP client 106 and/or the merchant 108) and the card issuer 124C and card type information. In an embodiment, based on the response received from one or more of the transaction control module 124A, the instalment service module 124B, and the issuer 124C, the orchestrator 112 may pass the data items pertaining to user preferences to the prompt generator 120.

[0048] At step 210, the prompt generator 120 parses the original query and evaluates the acquired data items based on the card art query along with additional information received from the orchestrator 112. The data items are evaluated with respect to any conditional statements in the query to determine whether any modification to the card art is required. If a modification is required, the prompt generator 120 parses the query again to determine what modifications are needed. Further, the prompt generator 120 constructs a natural language prompt to display the card art for the subject issuer 124C and card type with the appropriate modification. For example, the modification may represent a warning symbol overlaid on top of the digital payment card representation. In another example, a monthly instalment plan with the instalment amount may be displayed to the right of the digital payment card representation.

[0049] At step 212, the orchestrator 112 receives the prompt, generated by the prompt generator 120, and further passes the prompt to the text-to-image generator 122. Subsequently, the text-to-image generator 122 may process the prompt received in the form of text and generate a corresponding image related to a target card art with modification. Furthermore, the

modified card art in form of the image is transmitted to the client (the CTP client 106 and/or the merchant 108) and displayed to the user 102 over a display of the user device 104.

[0050] In an embodiment, generation of the corresponding image with modified card art may involve overwriting a designated area on the digital representation of the payment card with the modified card art. The designated area may be defined by the issuer 124C.

[0051] In an example, upon displaying the modified card art to the user 102, the user 102 may approve the transaction based on the modified card art and provide required authentication for completing the transaction. Subsequent to the authentication, the orchestrator 112 may communicate with the issuer 124C to process the transaction according to the user's preferences. In an embodiment, the processing of the transaction may be based on the parameters stored by the issuer 124C in the authorization database. In an example, the processing of the transaction may be based on the one-time preference(s) and/or new default preference(s) set by the issuer 124C for a particular type of transaction.

[0052] **FIG. 3** illustrates a block diagram of an exemplary payment processor system for implementing embodiments consistent with the present disclosure.

[0053] In an embodiment, FIG. 3 illustrates a block diagram of an exemplary computer system 300 that may be used to enable the dynamic card art service. In some embodiments, the computer system 300 is used to operate the dynamic card art platform 100A for providing dynamic card art. In some embodiments, the computer system 300 may include a central processing unit ("CPU" or "processor") 302. The processor 302 may include at least one data processor for executing processes in Virtual Storage Area Network. The processor 302 may include at least one data processor for executing program components for executing user or system-generated business processes. A user may include a person, a person using a device such as those included in this disclosure, or such a device itself. The processor 302 may include specialized processing units such as integrated system (bus) controllers, memory management control units, floating point units, graphics processing units, digital signal processing units, etc.

[0054] The processor 302 may be disposed in communication with one or more Input/Output (I/O) devices (311 and 312) via I/O interface 301. The I/O interface 301 employ

communication protocols/methods such as, without limitation, audio, analog, digital, monoaural, Radio Corporation of America (RCA) connector, stereo, IEEE-1394 high speed serial bus, serial bus, Universal Serial Bus (USB), infrared, Personal System/2 (PS/2) port, Bbayonet Neill-Concelman (BNC) connector, coaxial, component, composite, Digital Visual Interface (DVI), High-Definition Multimedia Interface (HDMI), Radio Frequency (RF) antennas, S-Video, Video Graphics Array (VGA), IEEE 802.11b/g/n/x, Bluetooth, cellular e.g., Code-Division Multiple Access (CDMA), High-Speed Packet Access (HSPA+), Global System for Mobile communications (GSM), Long-Term Evolution (LTE), Worldwide Interoperability for Microwave access (WiMax), or the like, etc.

[0055] Using the I/O interface 301, the computer system 300 may communicate with one or more I/O devices such as input devices 311 and output devices 312. For example, the input devices 311 may be an antenna, keyboard, mouse, joystick, (infrared) remote control, camera, card reader, fax machine, dongle, biometric reader, microphone, touch screen, touchpad, trackball, stylus, scanner, storage device, transceiver, video device/source, etc. The output devices 312 may be a printer, fax machine, video display (e.g., Cathode Ray Tube (CRT), Liquid Crystal Display (LCD), Light-Emitting Diode (LED), plasma, Plasma Display Panel (PDP), Organic Light-Emitting Diode display (OLED) or the like), audio speaker, etc.

[0056] In some embodiments, the processor 302 may be disposed in communication with a communication network 309 via a network interface 303. The user device 104 may be connected with the computer system 300 via the communication network 309. The network interface 303 may communicate with the communication network 309. The network interface 303 may employ connection protocols including, without limitation, direct connect, ethernet (e.g., twisted pair 10/100/1000 Base T), Transmission Control Protocol/Internet Protocol (TCP/IP), token ring, IEEE 802.11a/b/g/n/x, etc. The communication network 309 may include, without limitation, a direct interconnection, Local Area Network (LAN), Wide Area Network (WAN), wireless network (e.g., using Wireless Application Protocol), the Internet, etc. Using the network interface 303 and the communication network 309, the computer system 300 may communicate with a database, which may be the enrolled templates database. The network interface 303 may employ connection protocols include, but not limited to, direct connect, ethernet (e.g., twisted pair 10/100/1000 Base T), Transmission Control Protocol/Internet Protocol (TCP/IP), token ring, IEEE 802.11a/b/g/n/x, etc.

[0057] Communication network 309 includes, but is not limited to, a direct interconnection, a Peer-to-Peer (P2P) network, Local Area Network (LAN), Wide Area Network (WAN), wireless network (e.g., using Wireless Application Protocol), the Internet, Wi-Fi and such. The communication network 309 may either be a dedicated network or a shared network, which represents an association of the different types of networks that use a variety of protocols, for example, Hypertext Transfer Protocol (HTTP), Transmission Control Protocol/Internet Protocol (TCP/IP), Wireless Application Protocol (WAP), etc., to communicate with each other. Further, communication network 309 may include a variety of network devices, including routers, bridges, servers, computing devices, storage devices, etc.

[0058] In some embodiments, the processor 302 may be disposed of in communication with a memory 305 (e.g., RAM, ROM, etc. not shown in Fig. 3) via a storage interface 304. The storage interface 304 may connect to memory 305 including, without limitation, memory drives, removable disc drives, etc., employing connection protocols such as, Serial Advanced Technology Attachment (SATA), Integrated Drive Electronics (IDE), IEEE-1394, Universal Serial Bus (USB), fiber channel, Small Computer Systems Interface (SCSI), etc. The memory drives may further include a drum, magnetic disc drive, magneto-optical drive, optical drive, Redundant Array of Independent Discs (RAID), solid-state memory devices, solid-state drives, etc.

[0059] Memory 305 may store a collection of program or database components, including, without limitation, user interface 306, an operating system 307, a web browser 308 etc. In some embodiments, computer system 300 may store user/application data, such as, the data, variables, records, etc., as described in this disclosure. Such databases may be implemented as fault-tolerant, relational, scalable, secure databases such as Oracle or Sybase.

[0060] The operating system 307 may facilitate resource management and the operation of the computer system 300. Examples of operating systems include, without limitation, Apple™ Macintosh™ OS X, UNIX™, Unix-like system distributions (e.g., Berkeley Software Distribution (BSD), FreeBSD™, Net BSD™, Open BSD™, etc.), Linux distributions (e.g., Red Hat™, Ubuntu™, K-Ubuntu™, etc.), International Business Machines (IBM™) OS/2™, Microsoft Windows™ (XP™, Vista/7/8, etc.), Apple iOS™, Google Android™, Blackberry™ operating system (OS), or the like. The User interface 306 may facilitate display, execution, interaction, manipulation, or operation of program components through textual or graphical

facilities. For example, user interfaces may provide computer interaction interface elements on a display system operatively connected to the computer system 300, such as cursors, icons, checkboxes, menus, scrollers, windows, widgets, etc. Graphical User Interfaces (GUIs) may be employed, including, without limitation, Apple® Macintosh® operating systems' Aqua®, IBM® OS/2®, Microsoft® Windows® (e.g., Aero, Metro, etc.), web interface libraries (e.g., ActiveX®, Java®, Javascript, AJAX, HTML, Adobe® Flash®, etc.), or the like.

[0061] In some embodiments, the computer system 300 may implement web browser 308 stored program components. Web browser 308 may be a hypertext viewing application, such as Microsoft Internet Explorer, Google Chrome, Mozilla Firefox, Apple Safari, etc. Secure web browsing may be provided using secure hypertext transport protocol (HTTPS), Secure Sockets Layer (SSL), Transport Layer Security (TLS), etc. Web browsers 308 may utilize facilities such as AJAX, DHTML, Adobe Flash, JavaScript, Application Programming Interfaces (APIs), etc.

[0062] In some embodiments, the computer system 300 may implement a mail server stored program component. The mail server may be an Internet mail server such as Microsoft Exchange, or the like. The mail server may utilize facilities such as ASP, ActiveX, ANSI C++/C#, Microsoft .NET, Common Gateway Interface (CGI) scripts, Java, JavaScript, PERL, PHP, Python, WebObjects, etc. The mail server may utilize communication protocols such as Internet Message Access Protocol (IMAP), Messaging Application Programming Interface (MAPI), Microsoft Exchange, Post Office Protocol (POP), Simple Mail Transfer Protocol (SMTP), or the like.

[0063] In some embodiments, the computer system 300 may implement a mail client stored program component. The mail client may be a mail viewing application, such as APPLE® MAIL, MICROSOFT® ENTOURAGE®, MICROSOFT® OUTLOOK®, MOZILLA® THUNDERBIRD®, etc.

[0064] Furthermore, one or more computer-readable storage media may be utilized in implementing embodiments consistent with the present disclosure. A computer-readable storage medium refers to any type of physical memory on which information or data readable by a processor may be stored. Thus, a computer-readable storage medium may store instructions for execution by one or more processors, including instructions for causing the

processor(s) to perform steps or stages consistent with the embodiments described herein. The term “computer-readable medium” should be understood to include tangible items and exclude carrier waves and transient signals, i.e., be non-transitory. Examples include Random Access Memory (RAM), Read-Only Memory (ROM), volatile memory, non-volatile memory, hard drives, Compact Disc (CD) ROMs, DVDs, flash drives, disks, and any other known physical storage media.

[0065] The described operations may be implemented as a method, system or article of manufacture using standard programming and/or engineering techniques to produce software, firmware, hardware, or any combination thereof. The described operations may be implemented as code maintained in a “non-transitory computer readable medium”, where a processor may read and execute the code from the computer readable medium. The processor is at least one of a microprocessor and a processor capable of processing and executing the queries. A non-transitory computer readable medium may include media such as magnetic storage medium (e.g., hard disk drives, floppy disks, tape, etc.), optical storage (CD-ROMs, DVDs, optical disks, etc.), volatile and non-volatile memory devices (e.g., EEPROMs, ROMs, PROMs, RAMs, DRAMs, SRAMs, Flash Memory, firmware, programmable logic, etc.), etc. Further, non-transitory computer-readable media may include all computer-readable media except for transitory. The code implementing the described operations may further be implemented in hardware logic (e.g., an integrated circuit chip, Programmable Gate Array (PGA), Application Specific Integrated Circuit (ASIC), etc.).

[0066] The illustrated steps are set out to explain the exemplary embodiments shown, and it should be anticipated that ongoing technological development will change the manner in which particular functions are performed. These examples are presented herein for purposes of illustration, and not limitation. Further, the boundaries of the functional building blocks have been arbitrarily defined herein for the convenience of the description. Alternative boundaries can be defined so long as the specified functions and relationships thereof are appropriately performed. Alternatives (including equivalents, extensions, variations, deviations, etc., of those described herein) will be apparent to persons skilled in the relevant art(s) based on the teachings contained herein. Such alternatives fall within the scope and spirit of the disclosed embodiments. Also, the words "comprising," "having," "containing," and "including," and other similar forms are intended to be equivalent in meaning and be open ended in that an item or items following any one of these words is not meant to be an exhaustive listing of such item

or items or meant to be limited to only the listed item or items. It must also be noted that as used herein, the singular forms “a,” “an,” and “the” include plural references unless the context clearly dictates otherwise.

[0067] Furthermore, one or more computer-readable storage media may be utilized in implementing embodiments consistent with the present disclosure. A computer readable storage medium refers to any type of physical memory on which information or data readable by a processor may be stored. Thus, a computer readable storage medium may store instructions for execution by one or more processors, including instructions for causing the processor(s) to perform steps or stages consistent with the embodiments described herein. The term “computer readable medium” should be understood to include tangible items and exclude carrier waves and transient signals, i.e., are non-transitory. Examples include Random Access Memory (RAM), Read-Only Memory (ROM), volatile memory, non-volatile memory, hard drives, CD ROMs, DVDs, flash drives, disks, and any other known physical storage media.

[0068] Finally, the language used in the specification has been principally selected for readability and instructional purposes, and it may not have been selected to delineate or circumscribe the inventive subject matter. Accordingly, the disclosure of the embodiments of the disclosure is intended to be illustrative, but not limiting, of the scope of the disclosure.

[0069] With respect to the use of substantially any plural and/or singular terms herein, those having skill in the art can translate from the plural to the singular and/or from the singular to the plural as is appropriate to the context and/or application. The various singular/plural permutations may be expressly set forth herein for the sake of clarity.

“DYNAMIC CARD ART SERVICE”

ABSTRACT

The present disclosure provides a system and a method for implementing a dynamic card art service. The disclosure proposes using a dynamic card art platform, associated with a digital transaction service, to provide contextualized dynamic card art that is interactable. The card art provides a context related to a digital transaction. The platform receives transaction information from the client and parses the request to determine required data items. Cardholders may interact with the card art to make real-time payment preferences and/or decisions. The platform uses a data acquirer to connect with data sources to acquire the data items. Furthermore, the data items are evaluated to generate dynamic card art using a text-to-image generator. Thereafter, the generated card art is transmitted to the client in order to display, to a user, contextualized dynamic card art that can be interacted with, in real-time to customize digital payments.

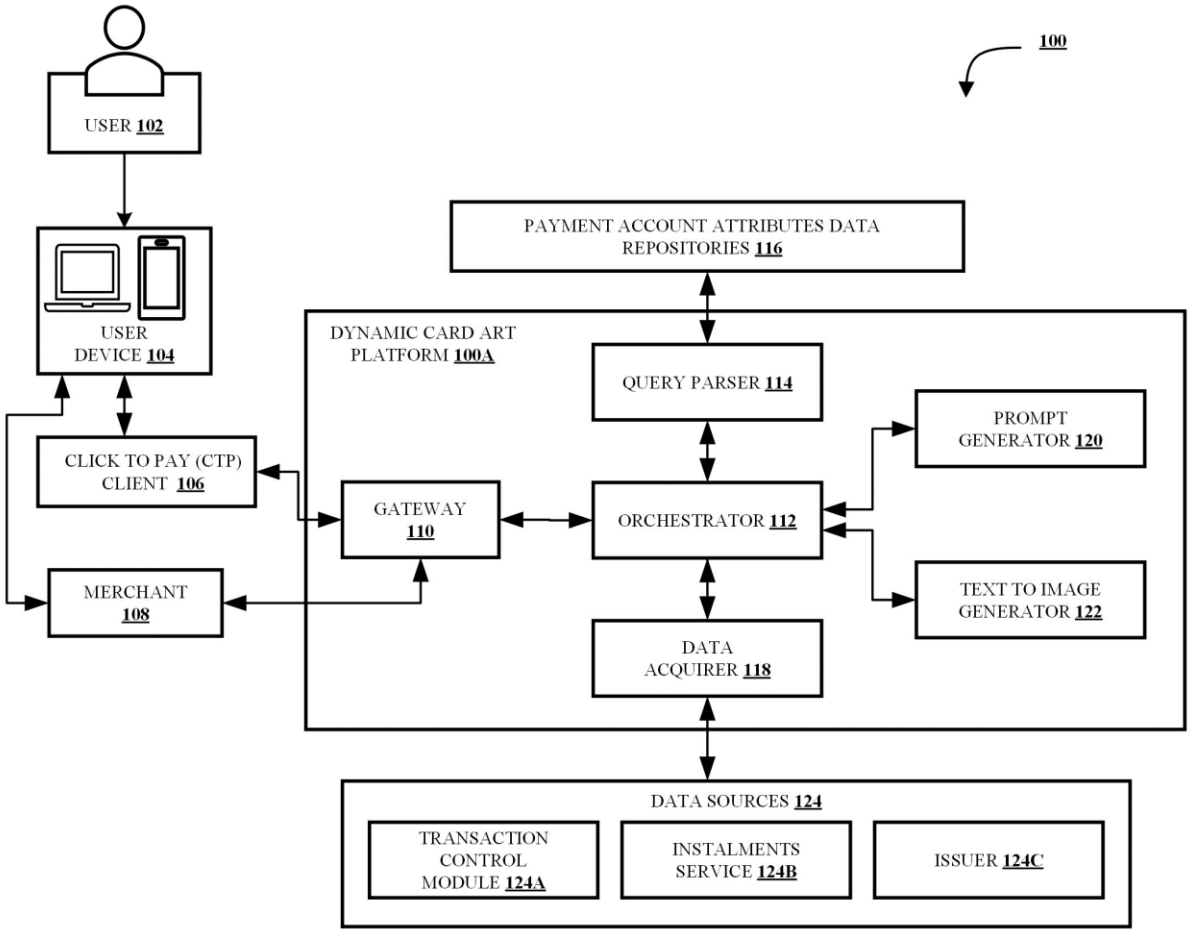
100
USER 102
USER DEVICE 104
CLICK TO PAY (CTP) CLIENT 106
MERCHANT 108
PAYMENT ACCOUNT ATTRIBUTES DATA REPOSITORIES 116
DYNAMIC CARD ART PLATFORM 100A
QUERY PARSER 114
GATEWAY 110
ORCHESTRATOR 112
PROMPT GENERATOR 120
TEXT TO IMAGE GENERATOR 122
DATA ACQUIRER 118
DATA SOURCES 124
TRANSACTION CONTROL MODULE 124A
INSTALMENTS SERVICE 124B
ISSUER 124C

FIG. 1

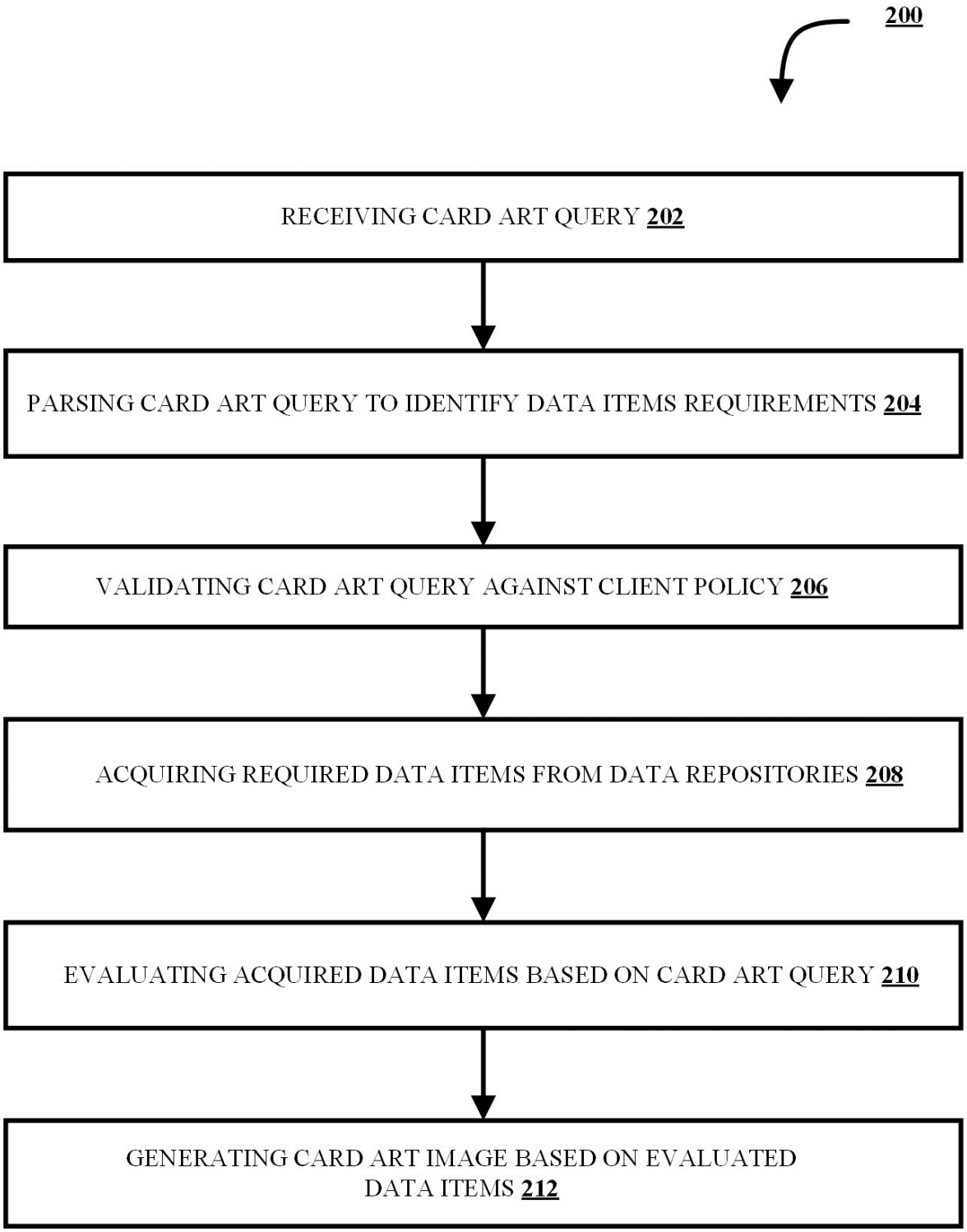
200
RECEIVING CARD ART QUERY 202
PARSING CARD ART QUERY TO IDENTIFY DATA ITEMS REQUIREMENTS 204
VALIDATING CARD ART QUERY AGAINST CLIENT POLICY 206
ACQUIRING REQUIRED DATA ITEMS FROM DATA REPOSITORIES 208
EVALUATING ACQUIRED DATA ITEMS BASED ON CARD ART QUERY 210
GENERATING CARD ART IMAGE BASED ON EVALUATED DATA ITEMS 212

FIG. 2

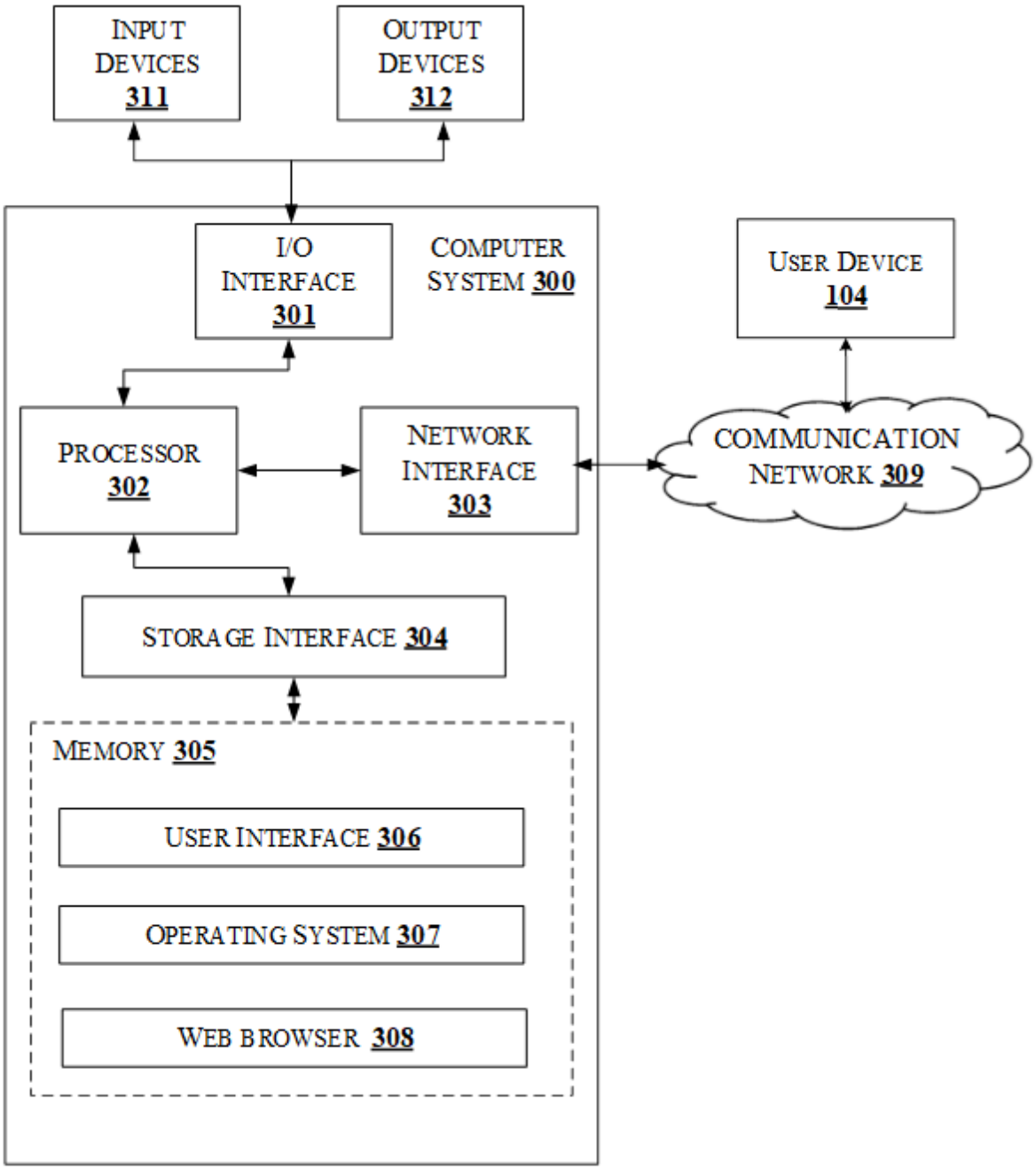
INPUT DEVICES 311
OUTPUT DEVICES 312
I/O INTERFACE 301
COMPUTER SYSTEM 300
USER DEVICE 104
PROCESSOR 302
NETWORK INTERFACE 303
COMMUNICATION NETWORK 309
STORAGE INTERFACE 304
MEMORY 305
USER INTERFACE 306
OPERATING SYSTEM 307
WEB BROWSER 308

FIG. 3