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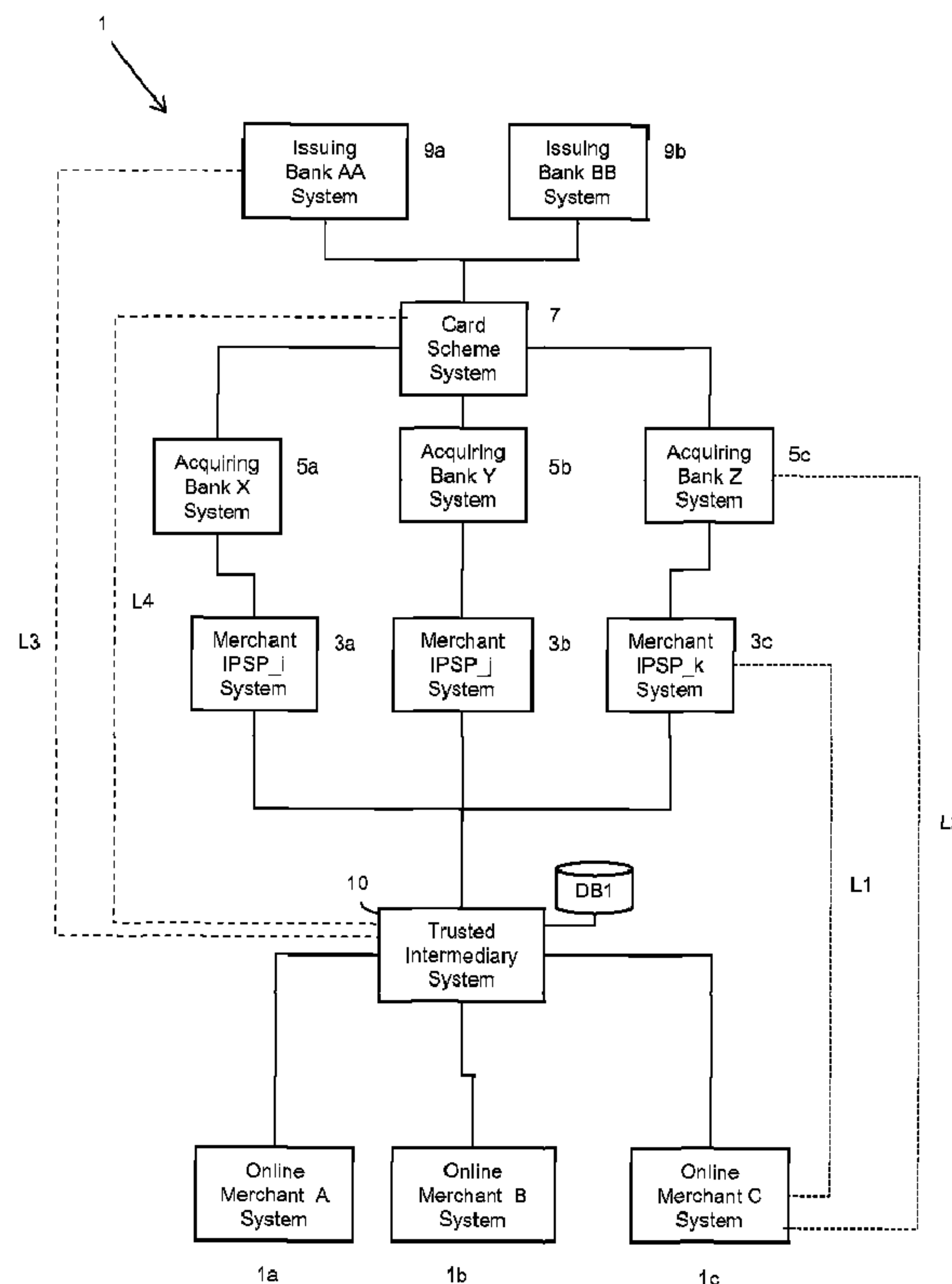
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(57) **Abrégé/Abstract:**

Embodiments of the invention provide a method of processing payment authorisation requests for payment transactions to be conducted via a data communications network on behalf of online merchants, the payment authorisation requests being

**(57) Abrégé(suite)/Abstract(continued):**

conducted as a result of orders by financial instrument holders via a plurality of different online merchant systems, each of said online merchants having an online merchant identity. The method is conducted by a trusted central intermediary system which is arranged to transmit payment authorisation requests to each of a plurality of different online merchant Internet Payment Service Provider (IPSP) systems; each merchant IPSP system is arranged to transmit payment authorisation requests to at least one of a plurality of acquiring bank payment processor systems, and each of said plurality of acquiring bank payment processor systems is responsible for processing payment authorisations for at least one of said acquiring banks. The method comprises: receiving from a first online merchant system, responsible for originating payment authorisation requests for a first online merchant, a payment authorisation request relating to authorisation of a payment transaction, said received payment authorisation request being initiated as a result of a financial instrument holder conducting an order via the first online merchant system; in response to receiving said request: a) generating a payment authorisation request comprising transaction data including: i) a financial instrument identity to be used in the payment transaction by the financial instrument holder; and ii) an online merchant identity, associated with the first online merchant, as the payment transaction beneficiary; and iii) one or more transaction details including a payment amount; and b) retrieving transmission data to enable the transmission of payment authorisation request data to a selected merchant IPSP system associated with the first online merchant; and on the basis of the retrieved transmission data, transmitting said generated payment authorisation request to the selected merchant IPSP system, wherefrom a further payment authorisation request may be generated and transmitted to an acquiring bank payment processor system responsible for processing payment authorisations for the acquiring bank with which the first online merchant is associated. Embodiments of the invention enable a user to select a payment method on a per transaction basis, whilst removing the requirement for the user to provide payment details to individual online merchant systems or to their merchant IPSP systems. Thus, providing that online merchants, or their merchant IPSPs, subscribe to a service arranged to perform the method, users only have to submit their respective payment details, preferably only once, to a separate, trusted entity.

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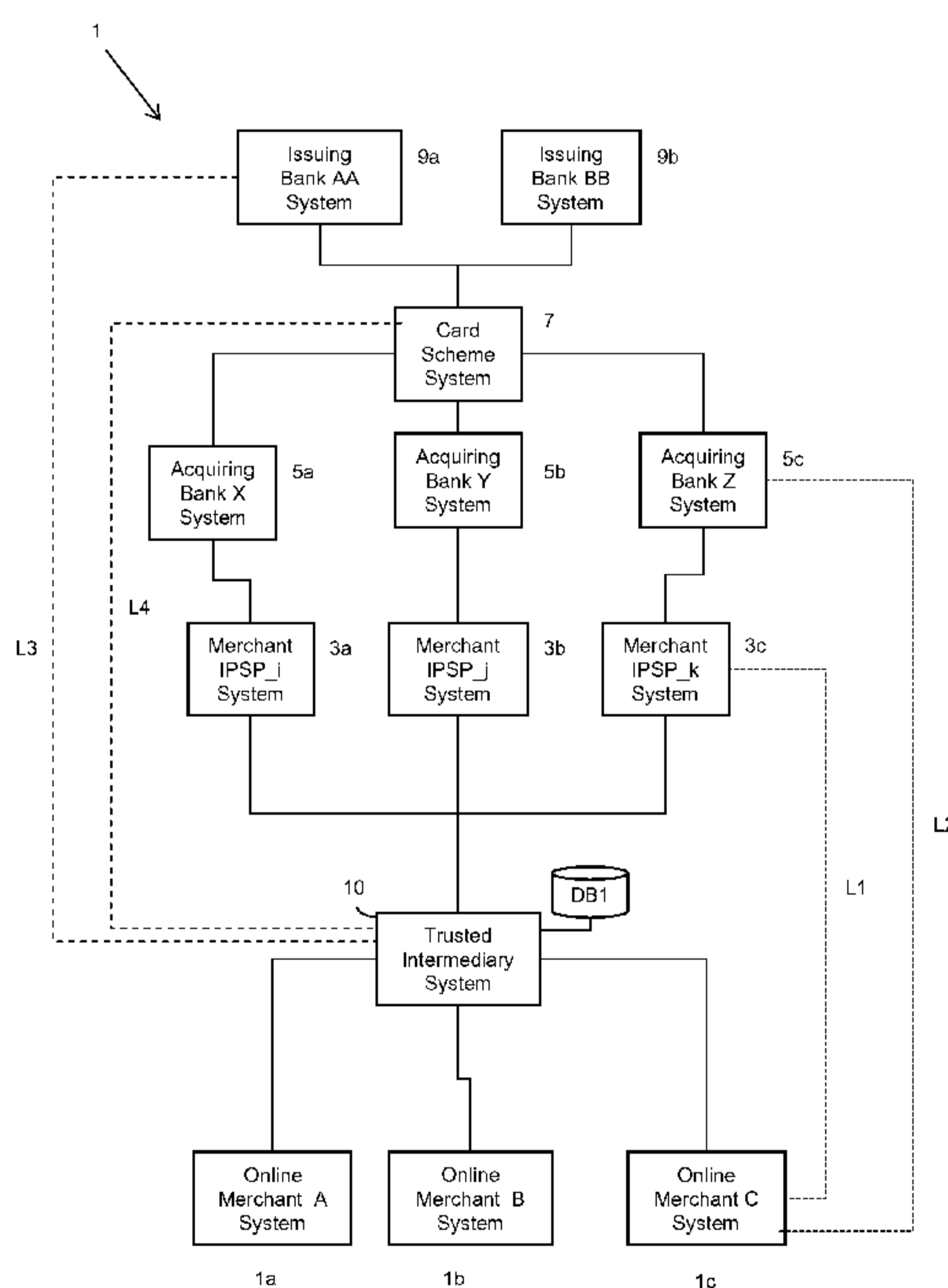


Figure 2

(57) Abstract: Embodiments of the invention provide a method of processing payment authorisation requests for payment transactions to be conducted via a data communications network on behalf of online merchants, the payment authorisation requests being conducted as a result of orders by financial instrument holders via a plurality of different online merchant systems, each of said online merchants having an online merchant identity. The method is conducted by a trusted central intermediary system which is arranged to transmit payment authorisation requests to each of a plurality of different online merchant Internet Payment Service Provider (IPSP) systems; each merchant IPSP system is arranged to transmit payment authorisation requests to at least one of a plurality of acquiring bank payment processor systems, and each of said plurality of acquiring bank payment processor systems is responsible for processing payment authorisations for at least one of said acquiring banks. The method comprises: receiving from a first online merchant system, responsible for originating payment authorisation requests for a first online merchant, a payment authorisation request relating to authorisation of a payment transaction, said received payment authorisation request being initiated as a result of a financial instrument holder conducting an order via the first online merchant system; in response to receiving said request: a) generating a payment authorisation request comprising transaction data including: i) a financial instrument identity to be used in the payment transaction by the financial instrument holder; and ii) an online merchant identity, associated with the first online merchant, as the payment transaction beneficiary; and iii) one or more transaction details including a payment amount; and b) retrieving transmission data to enable the transmission of payment authorisation request data to a selected merchant IPSP system associated with the first online merchant; and on the basis of the retrieved transmission data,

transmitting said generated payment authorisation request to the selected merchant IPSP system, wherefrom a further payment authorisation request may be generated and transmitted to an acquiring bank payment processor system responsible for processing payment authorisations for the acquiring bank with which the first online merchant is associated. Embodiments of the invention enable a user to select a payment method on a per transaction basis, whilst removing the requirement for the user to provide payment details to individual online merchant systems or to their merchant IPSP systems. Thus, providing that online merchants, or their merchant IPSPs, subscribe to a service arranged to perform the method, users only have to submit their respective payment details, preferably only once, to a separate, trusted entity.

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## Payment System

### Field of the Invention

The present invention relates to a system and method of processing  
5 payment authorisation requests for payment transactions to be conducted via a  
data communications network on behalf of online merchants, and is particularly,  
but not exclusively, suited to the processing of orders placed by financial  
instrument holders.

### 10 Background of the Invention

Users are increasingly encouraged to purchase goods online, i.e. via the  
Internet and associated technologies. Generally speaking, existing online  
payment systems fall into one of three types of arrangements: in a first type of  
arrangement, an online merchant system collects payment details from a  
15 financial instrument holder, otherwise known as a buyer or cardholder, without  
the buyer dealing directly with any other entity that may be involved in the  
transaction, and the online merchant system sends the transaction details directly  
to their acquiring bank system. In a second type of arrangement, the online  
merchant system collects payment details from a buyer without the buyer  
20 dealing directly with any other entity that may be involved in the transaction,  
and the online merchant system sends the transaction details to an online  
merchant Internet Payment Service Provider (IPSP) which processes payment  
authorisations on behalf of the merchant. The merchant IPSP system  
subsequently transmits the details to the online merchant's acquiring bank  
25 system; the details may be transmitted directly to the acquiring bank or to a  
payment processor which acts on behalf of the acquiring bank. Examples of  
IPSP systems which provide support for this second type of arrangement include  
the Protx™ Veri-Secure Payment system (VSP).

In an arrangement of the first and second type, the online merchant  
30 system typically obtains payment card data, bank account information and/or  
other financial data from the buyer. The online merchant system then passes this  
information either directly, or via a merchant IPSP system, to an acquiring bank

processing system. Each online merchant system is assigned an online merchant account identifier by an acquiring bank, and this account identifier is used to identify the online merchant to the acquiring bank when requesting authorisation of a transaction.

5           Figure 1 shows an example of conventional online payment systems according to arrangements of the second type, comprising a plurality of online merchant systems 1a, 1b, 1c. In this arrangement each of the online merchants is in operative association with an online merchant Internet Payment Service Provider (IPSP) system 3, which is a payment gateway selected and subscribed  
10 to by the online merchant for the purposes of conducting secure business on the Internet. Whilst the figure shows each of the online merchant systems 1a ... 1c being associated with the same merchant IPSP system 3, alternatively, and in fact often in practice, online merchant systems are linked to different merchant IPSP systems 3. Each merchant IPSP system 3 provides a system that passes  
15 payment card data, authorisation requests, and authorisation responses over the Internet using encryption technology. The transaction information is sent by the merchant IPSP system 3, via a data communications link, to the acquiring bank 5, and thence to the card scheme system 7 which intermediates with an issuing bank where the validity of the card is checked and the availability of funds on  
20 that account is verified. An authorisation code is returned to the merchant IPSP system 3; the authorisation is encrypted by the merchant IPSP system 3 and transmitted in encrypted form to the online merchant system 1a, which triggers fulfilment of the order.

A conventional end-to-end online transaction using an arrangement of  
25 the second type and involving the entities shown in Figure 1 comprises the following steps:

\* An online merchant's system 1a website collects from a buyer one or more order selections. The buyer checks out, enters their payment details and places an order on the online merchant's system 1a website by pressing the 'Submit  
30 Order' or equivalent button on the merchant website's order transmission webpage.

- \* The buyer's web browser encrypts the information to be sent between the browser and the online merchant's web server.
- \* The online merchant then forwards the transaction details to their merchant IPSP system 3, typically via another encrypted connection to the payment server  
5 hosted by the merchant IPSP system 3.
- \* The merchant IPSP system 3 forwards the transaction information, including the online merchant's internet account identifier, to the processor used by the online merchant's acquiring bank system 5.
- \* The processor 5 forwards the transaction information to the payment scheme  
10 system 7 (e.g. Visa/MasterCard)
- \* The payment scheme system 7 routes the transaction to the correct card issuing bank system 9.
- \* The payment card issuing bank system 9 receives the authorisation request and sends a response back to the processor of the online merchant's acquiring bank  
15 system 5 with a response code.
- \* The processor of the online merchant's acquiring bank system 5 forwards the response to the merchant IPSP system 3.
- \* The merchant IPSP system 3 receives the response, and forwards it on to the online merchant's system where it is interpreted and a relevant response then  
20 relayed back, via the merchant to the buyer confirming that the transaction has been authorised.
- \* The merchant IPSP system 3, on behalf of the online merchant, submits all their approved authorisations to the online merchant's acquiring bank system 5 for settlement.
- \* The acquiring bank system 5 deposits the total of the approved funds minus  
25 any fees and charges in to the online merchant's nominated account. This could be an account with the acquiring bank if the online merchant does their banking with the same bank, or an account with another bank.

An advantage of using a payment gateway such as the merchant IPSP  
30 system shown in Figure 1 is that the merchant IPSP system can provide one or more additional various transaction processing functions, for example settlement, handling of chargebacks, handling of refunds, and transaction

reporting, on behalf of the online merchant. In the settlement procedure, the merchant IPSP system 3 submits all the online merchant's approved authorisations collected over a given period, in a "batch", to the online merchant's acquiring bank system 5 for settlement. A chargeback is a reversal of a payment card transaction initiated by the buyer or the bank that issued the card used in the purchase. This differs from a refund, which is agreed to and initiated by the online merchant, via the merchant IPSP system 3. Transaction reporting involves providing an overview reporting function for accumulated transactions which have been authorised and optionally settled via the merchant IPSP system 3, so that a merchant can for example select a date range and see an overview relating to all transactions conducted within the selected date range. A merchant IPSP system 3 may provide an online merchant with a secure online website whereby to approve chargebacks, initiate refunds and/or view transaction reports as described.

However, in each of the first and second types of payment systems described above, a buyer is required to provide his or her payment information separately for transactions initiated with each different online merchant. Thus, for each new online merchant that a buyer interacts with, the risk of exposure, misappropriation and/or fraudulent use of the buyer's financial data increases.

In a third type of arrangement (not shown) the online merchant system redirects the buyer to an alternative payment system website with which the buyer interacts in order to complete the transaction. The alternative payment system interacts directly with the user who provides payment to the alternative payment system either directly from their bank account or via a mechanism such as a payment card. Where a payment card from a conventional payment scheme is used the alternative payment system performs the role of the merchant in the conventional payment system, submitting a payment demand through an acquiring system. Payment from the user is made to the alternative payment system. The alternative payment system is then responsible for any reimbursement of the merchant. In a second case, the alternative payment system can, in effect, behave as a conventional clearing house, funding a user's account within the alternative payment system from the user's actual issuing



bank account by directly debiting their account. The alternative payment system subsequently ensures payment is sent to the merchant's issuing bank account, usually through a conventional clearing house. This merchant bank account may or may not be the same as their account held with their conventional acquiring system.

5 Thus most of the time payment systems of the third type act as the intermediary to take actual funds from the user and pass them to the merchant, most usually via the consumer's and merchant's individual bank accounts, potentially holding on to those funds as they pass through accounts held by the payment system; an example of this third type of payment system includes the well known PayPal<sup>(TM)</sup> payment system.  
10 Such a payment system may also have the capability to operate as a conventional IPSP, for example by providing associated online payment handling services.

Whilst this type of payment system relieves the need for the user to set up individual payment accounts on a per online merchant basis, the user has a relationship with the alternative payment system and not with the online merchant  
15 system; this gives rise to several notable disadvantages: firstly the online merchant neither receives payment directly from an acquiring bank nor can avail itself of a payment-scheme based guarantee of payment, because for these transactions there is no direct relationship between the merchant and a card payment scheme. Secondly, for transactions effected via card payment the buyer does not have  
20 visibility of the individual online merchant from whom the product was bought (instead the card statement identifies the alternative payment system entity). Thirdly, the buyer is not protected by the card scheme's rules and may not be protected by any applicable consumer protection, because the transaction is with the payment system, and not with the online merchant system.

25

### Summary of the Invention

In accordance with at least one embodiment of the invention, systems and software are provided for processing payment authorisation requests for

payment transactions to be conducted via a data communications network on behalf of online merchants.

More particularly, aspects of the invention provide a method of processing payment authorisation requests for payment transactions to be conducted via a data communications network on behalf of online merchants, the payment authorisation requests being conducted as a result of orders by financial instrument holders via a plurality of different online merchant systems, each of said online merchants having an online merchant identity, and each of said online merchants being associated with one of a plurality of acquiring banks,

wherein the method is conducted by a trusted central intermediary system which is arranged to transmit payment authorisation requests to each of a plurality of different online merchant Internet Payment Service Provider (IPSP) systems,

each of said merchant IPSP systems being arranged to transmit payment authorisation requests to at least one of a plurality of acquiring bank payment processor systems, each of said plurality of acquiring bank payment processor systems being responsible for processing payment authorisations for at least one of said acquiring banks,

the method comprising:

receiving from a first online merchant system, responsible for originating payment authorisation requests for a first online merchant, a payment authorisation request relating to authorisation of a payment transaction, said received payment authorisation request being initiated as a result of a financial instrument holder conducting an order via the first online merchant system;

in response to receiving said request:

a) generating a payment authorisation request comprising transaction data including:

i) a financial instrument identity to be used in the payment transaction by the financial instrument holder; and

ii) an online merchant identity, associated with the first online merchant, as the payment transaction beneficiary; and

iii) one or more transaction details including a payment amount; and

5 b) retrieving transmission data to enable the transmission of payment authorisation request data to a selected merchant IPSP system associated with the first online merchant; and

on the basis of the retrieved transmission data, transmitting said generated payment authorisation request to the selected merchant IPSP system,  
10 wherefrom a further payment authorisation request may be generated and transmitted to an acquiring bank payment processor system responsible for processing payment authorisations for the acquiring bank with which the first online merchant is associated.

Preferably the method comprises receiving data indicating a selection, by  
15 the financial instrument holder, between a plurality of different financial instruments for use in the payment transaction, and retrieving a financial instrument identity to be used in the generated payment authorisation request on the basis of said indicated selection. The different financial instruments are advantageously held in a local store, or user wallet, by the trusted intermediary  
20 system. Thus embodiments of the invention enable a financial instrument holder, or user, to select a payment method on a per transaction basis, whilst removing the requirement for the user to provide payment details to individual online merchant systems or to their merchant IPSP systems. Thus, providing that online merchants, or their merchant IPSPs, subscribe to a service arranged to  
25 perform the method, users only have to submit their respective payment details, preferably only once, to a separate, trusted entity. This has the benefit of reducing the risk of fraud that may be incurred in relation to conventional arrangements of payment systems, whilst allowing users to effect transactions more quickly and conveniently because there is no need for the user to input  
30 personal and financial information in respect of each transaction.

As to population of the user's wallet with payment instrument details, the trusted central intermediary system preferably provides a registration

interface for a financial instrument holder whereby the financial instrument holder can provide a financial instrument identity for registration with said trusted central intermediary system as stored registration data. When processing a payment authorisation request the method comprises the step of authenticating a financial instrument holder and, in response thereto, retrieving a registered financial instrument identity, preferably from the user's wallet, to be used in the generated payment authorisation request from said stored registration data.

It is to be understood that the terms "online merchant", "merchant IPSP system", "trusted central intermediary system and "acquiring bank payment processor system" refer to logical components. As such, each system may be embodied physically separate from one another or physically connected to one or more other system. For example, in arrangements where a given organisation hosts the merchant IPSP system and the online merchant, the components could be physically located on the same network or even integrated as part of a single system. Further, where a given organisation hosts the merchant IPSP system and acquiring bank payment processor system, the components could be physically located on the same network or even integrated as part of a single system. Further still, a single organisation could host the online merchant, the merchant IPSP system and the acquiring bank payment processing system. Thus, embodiments of the invention encompass arrangements in which the functions performed under the role of the IPSP can be carried out by an organisation that is also the merchant and/or also the acquirer.

Because the transactions which are authorised using the system of the present invention are still processed by the merchant IPSP system, merchant IPSP functions relating to these transactions may be accessed by the online merchant using an interface common to different transaction types. These transaction types may include both transaction types for which payment authorisation requests originate via the trusted intermediary system and other, separately authorised, transaction types which may be processed by the IPSP on behalf of the merchant without passing via the trusted intermediary system. This common interface may comprise a secure online website.

In at least one arrangement the trusted central intermediary system receives a payment authorisation response from said selected merchant IPSP system, and in response thereto transmits a payment authorisation response to said first online merchant system. Further, the method comprises receiving an  
5 online merchant identity from the first online merchant system, the online merchant identity included in the generated authorisation request being generated on the basis of the received online merchant identity. Thus, since the trusted intermediary system interfaces with, rather than replaces, an online merchant's existing IPSP system, it is the online merchant's account identifier  
10 that is transmitted to the acquiring bank. As a result, the relationship for such transactions is between the buyer and the online merchant, with the resulting benefit that the buyer is protected by the card scheme's rules and, in some eventualities, compliance with any applicable consumer protection. In addition, the merchant IPSP system can provide one or more additional various  
15 transaction processing functions, for example settlement, handling of chargeback, handling of refunds, and transaction reporting, on behalf of the online merchant system. In particular the merchant IPSP system may provide an online merchant with a secure online website whereby to approve chargebacks, initiate refunds and/or view transaction reports relating to transactions  
20 authorised through the system of the present invention.

Preferably the step of retrieving transmission data to enable the transmission of payment authorisation request data to a selected merchant IPSP system associated with the first online merchant comprises retrieving a network address for the selected merchant IPSP system on the basis of the merchant IPSP  
25 system registered by the first online merchant, and the step of transmitting said generated payment authorisation request to the selected merchant IPSP system comprises transmitting said generated payment authorisation request on the basis of the retrieved network address. The network addresses are preferably populated on a per online merchant basis, for example when a given online  
30 merchant registers with the trusted intermediary system, thereby providing a convenient, centralised mechanism for controlling the flow of payment authorisation requests. Thus the trusted central intermediary system preferably

provides a registration interface for online merchants whereby a given online merchant can register a merchant IPSP system with which the online merchant is associated.

In at least some arrangements the trusted central intermediary system can cooperate with a plurality of issuing authentication systems, each being responsible for conducting authentication for a different issuing bank, the method comprising the step of selectively communicating with a respective issuing authentication system so as to verify the identity of the financial instrument holder. This verification of the user can be performed using the known 3-D Secure method, and can be performed when e.g. the user adds a payment instrument to their user wallet via the afore-mentioned registration interface.

The user can register with the trusted intermediary system via several different mechanisms, including: direct with the intermediary system; indirect via a trusted third party; and re-direction via an online banking service. In relation to the third alternative, the method comprises the step of retrieving a financial instrument identity to be used in the generated payment authorisation request on the basis of the authentication of the instrument holder by a selected one of said plurality of issuing authentication systems. Thereafter data are transmitted to the financial instrument holder, enabling the financial instrument holder to perform authentication with respect to a selected authentication system, and receiving authentication response data from said selected authentication system in response to authentication of the financial instrument holder by the selected issuing authentication system. Further, embodiments of the invention can include receiving data indicating a financial instrument identity to be used in the generated payment authorisation request from said selected issuing authentication system in response to authentication of the financial instrument holder by the selected issuing authentication system.

According to further aspects of the invention there is provided a trusted intermediary system in communication with a plurality of online merchant systems and a plurality of merchant IPSP systems, said trusted intermediary system being arranged to conduct the afore-mentioned trusted intermediary

system steps. Further, there is provided an online merchant system in communication with a trusted intermediary system and a plurality of merchant IPSP systems, said online merchant system being arranged to conduct the afore-mentioned online merchant system steps. Further still there is provided a  
5 merchant IPSP system in communication with a trusted intermediary system and a plurality of online merchant systems, said merchant IPSP system being arranged to conduct the afore-mentioned merchant IPSP system steps.

Aspects of the invention also provide software distributed between the various systems, suitably configured to perform the afore-mentioned method.

10 Further features and advantages of the invention will become apparent from the following description of preferred embodiments of the invention, given by way of example only, which is made with reference to the accompanying drawings.

#### 15 Brief Description of the Drawings

Figure 1 is a schematic diagram showing a conventional payment system;

Figure 2 is a schematic diagram showing a payment system according to an embodiment of the invention;

20 Figure 3 is a schematic flow diagram showing the flow of data during use of the payment system of Figure 2 according to an embodiment of the invention;

Figure 4 is a schematic block diagram showing components of the trusted intermediary system of Figure 2 according to an embodiment of the  
25 invention; and

Figure 5 is a schematic timing diagram showing the flow of messages between selected components of the payment system of Figure 2 according to an embodiment of the invention.

#### 30 Detailed Description of the Invention

As described above, embodiments of the invention are concerned with a payment system and method, specifically a system and method of processing

payment authorisation requests for payment transactions to be conducted via a data communications network on behalf of online merchants. The system involves a novel transactional entity, herein referred to as a trusted intermediary system, which cooperates with the conventional payment entities described in the background section with reference to Figure 1.

Figure 2 depicts a schematic illustration of a payment system according to an embodiment of the invention. The trusted intermediary system 10 is shown as transmitting payment authorisation requests to each of a plurality of different merchant IPSP systems 3a ... 3c. Each of the online merchant processing systems 1a ... 1c is associated with one of the merchant IPSP systems 3a ... 3c as indicated by the dotted line L1 for one of the online merchants 1c, as well as being associated with one of the acquiring banks 5c, as indicated by the dotted line L2, again for online merchant 1c. At least some of the merchant IPSP systems 3b, 3c can be arranged to transmit payment authorisation requests to more than one acquiring bank: this reflects the fact that more than one online merchant may process their payments via a given merchant IPSP system; each merchant has an account with a particular acquiring bank.

Further, each online merchant system 1a ... 1c website's order transmission webpage includes, as a novel payment option, referred to herein as "Secure System of Payment" (SSP), this identifying payment via the trusted intermediary system 10. Other payment options, including conventional online payment options, may also be included whereby a buyer can select a payment option which does not involve payment authorisation being processed through the trusted intermediary system 10. Such separately authorised transactions may for example include conventional online payment options in which a buyer enters their payment details into the online merchant system 1c directly, or the merchant IPSP system 1c directly, rather than using the trusted intermediary system 10. In respect of such transactions the trusted intermediary system 10 interfaces with, rather than replaces, the online merchant IPSP system 3c, which may be the online merchant's existing merchant IPSP system when subscribing to the service provided by the trusted intermediary system 10. This is to say that because payment systems according to embodiments of the invention involve



the addition of the trusted intermediary system 10 within an existing and known set of processing entities, payments can be made according to conventional methods using the second and third types of arrangement described with reference to Figure 1 in addition, or as an alternative to, via the trusted intermediary system 10.

The trusted intermediary system 10 holds data in a database DB1 corresponding to users (buyers) and online merchants that have registered with the intermediary 10, together with transaction data. As will be described in more detail below, the database DB1 holds a set of payment details for the user in the form of a stored set of records conveniently referred to herein as a remote store or user wallet; users can add details of payment instruments (typically cards and accounts) from which they can select to make payment for a transaction, causing the trusted intermediary system to update the contents of the user's remote store. Since the trusted intermediary system 10 holds a range of payment instruments available to the user, the user can select a payment method on a per transaction basis. Thus, provided online merchants subscribe to the trusted intermediary system 10, users only have to submit their respective payment details once, to a single entity, thereby removing the requirement for the user to provide payment details to individual online merchants each time they shop online. This has the benefit of reducing the risk of fraud that may be incurred in relation to conventional arrangements of payment systems (such as that shown in Figure 1).

Because transaction authorisation requests which are originated using the trusted intermediary system 10 are passed to and processed by the IPSP system 3c, additional various transaction processing IPSP functions relating to these transactions may be accessed by the online merchant via the trusted intermediary system 10. The merchant IPSP system 3c can provide one or more such additional transaction processing functions, for example settlement, handling of chargeback, handling of refunds, and transaction reporting, on behalf of the online merchant system 1c. The merchant IPSP system 3c preferably provides the online merchant with a secure online website whereby to approve chargebacks, initiate refunds and/or view transaction reports relating to transactions authorised through the trusted intermediary system 10.

Further, since transaction authorisation requests which are originated using the trusted intermediary system 10 are passed to and processed by the IPSP system 3c, IPSP functions relating to these transactions may be accessed by the online merchant using an IPSP system interface which is common to different transaction types, including both transaction types authorised via the trusted intermediary system 10 and other, separately authorised, transaction types which may be processed by the IPSP on behalf of the merchant without passing via the trusted intermediary system 10. Such separately authorised transactions may for example include transactions for which a buyer enters their payment details into the online merchant system 1e directly, or the merchant IPSP system 3c directly, for use in payment authorisations conducted by the merchant IPSP system 1c.

Further still, it is the online merchant internet account identifier that is transmitted to the acquiring bank 5c by the merchant IPSP system 3c as part of the payment authorisation request. This has the benefit of ensuring the buyer is protected by the card scheme's rules and, in some eventualities, compliance with any applicable consumer protection; in addition each transaction can be identified on a per online merchant basis on the user's card statements.

As can be seen from Figure 2, specifically dotted line L3, the trusted intermediary system 10 is connected to issuing bank system 9a (while only one connection is shown, it is to be understood that there can be a connection between the trusted intermediary system 10 and any number of issuing bank systems). This connection facilitates verification of the cardholder (buyer) using the well known 3-D Secure authentication mechanism. The protocol for 3-D Secure is documented in US patent application 10/156,271, published under publication number US2002/0194138 in the name of Visa International service Association. The protocol uses messages (typically XML messages) sent over Secure Sockets Layer (SSL) connections, as is documented in the afore-mentioned patent publication as the Payer Authentication Service (PAS). This service may be employed when the trusted intermediary system 10 determines a given requested transaction to correspond to a predetermined level of risk, such

as may be the case for transactions involving shipping abroad of high-value goods. The means by which the risk assessment is performed and indeed a risk level determined for a given transaction is described in more detail below.

The card scheme system 7 is communicatively connected to the trusted intermediary system 10 as schematically shown by dotted line L4; this indicates the trusted intermediary system 10 having subscribed to an account updating service (not labelled on Figure 2, but described with reference to Figure 4 below as part 415d) provided by the card scheme system 7 and thence receive updated card information, e.g. when a card is lost, is stolen or has expired, and thus has been re-issued to the user. An example of such a service is the Visa Account Updater service (VAU), while another is the Mastercard Automatic Billing Updater. In one arrangement the interface to the account updating service provided by the card scheme system 7 is batch oriented: the trusted intermediary system 10 submits a request or requests to the card scheme system 7, the request including details of certain users registered with the system 10. A batch interface is typically used (e.g. Secure File Transfer Protocol (SFTP) or Connect:Direct<sup>(TM)</sup>) to send the request file(s) to the account updating service, which is responsible for gathering details of re-issued cards. After an interval the trusted intermediary system 10 accesses the account updating service and collects the response file(s), thereafter updating payment instruments locally for the relevant subscribers to the SSP system. Alternatively the interface could be message-based, so that individual Primary Account Numbers can be verified or updated in real-time. As an alternative to sending the request directly to the card scheme system 7, the trusted intermediary system 10 could emulate operation of an online merchant send the request to the known acquiring bank systems 5a ... 5c, for subsequent forwarding to the card scheme system 7.

Referring now to Figure 3, operation of the payment system 1 according to an embodiment of the invention will now be described. At step S301 the user completes their shopping experience with online merchant C's online merchant system, initiates checkout using the online merchant system, and proceeds to the virtual checkout, according to conventional methods available through commonly available shopping cart and check-out software packages such as are

known to the skilled person. The user selects “Secure System for Payment” (SSP) as a payment option (step S301), causing the online merchant system 1c to transmit an originating payment authorisation request message to the trusted intermediary system 10 (step S303); the originating request message comprises  
5 at least an amount of payment for the selected goods, the online merchant account identifier and an identifier for the order. The trusted intermediary system 10 then transmits a login URL to the user (step S305), prompting the user to login, or, if this is their first time of selecting SSP as a payment option, to register with the trusted intermediary system 10. Assuming for the purposes  
10 of this example that the user has previously registered with the service, the user inputs their login credentials (e.g. username, password, or other authentication details, dependent on the authentication mechanism utilised by the trusted intermediary system 10-step S307).

The trusted intermediary system 10 then performs a lookup based on the  
15 user’s credentials and identification details (step S309), retrieving details from the user’s remote store from the database DB1, and presenting same to the user for their selection of payment method (step S310). Upon selection of the desired payment method from options provided according to the details retrieved from user’s remote store the trusted intermediary system 10 sends a payment  
20 authorisation request message to the online merchant’s IPSP system 3c, the payment authorisation request message comprising the selected payment instrument details, the amount of payment required and the online merchant identifier (step S311). The merchant IPSP system 3c sends a further payment authorisation request to the relevant acquiring bank 5c (step S313), prompting  
25 authorisation (or otherwise) per conventional methods (step S315) and the transmission of a response message from the acquiring bank 5c to the merchant IPSP system 3c (step S317). Assuming the response to comprise confirmation of the payment having been authorised, at step S319, the merchant IPSP system 3c sends a payment success notification message to the trusted intermediary system  
30 10. This payment success notification message comprises a reference for the card scheme authorisation and a transaction identifier for the card scheme transaction.

Thereafter the trusted intermediary system 10 sends a payment success confirmation message to the online merchant system 1c (step S321), which prompts the online merchant system to confirm the order status to the user (step S323).

5 It will be appreciated from the foregoing that conventional online merchant systems (including their merchant IPSP system) require modifying to include “Secure System for Payment” (SSP) as a payment option and indeed to interface with the trusted intermediary system 10. Accordingly the merchant IPSP system exposes a payment authorisation service to the trusted intermediary  
10 system 10 that allows payment & settlement for payment instruments (typically cards and bank accounts). Further it will be appreciated that because the trusted intermediary system 10 integrates with many merchant IPSP systems, it thus comprises a plurality of interface formats and protocols, each corresponding to a respective merchant IPSP system. In addition, each online merchant’s system is  
15 configured with integration software components, e.g. in the form of plugins, which enables the online merchant to integrate with the trusted intermediary system 10 for the purpose of initiating a payment transaction using SSP as a payment method.

Details of the configuration and processing capabilities of the trusted  
20 intermediary system 10 will now be described with reference to Figure 4. The trusted intermediary system 10 comprises presentation and connectivity processing components, which are configured to transmit and manage various user-specific and online merchant-specific data; these processing components will be explained in more detail below, but in overview they comprise the  
25 following:

#### **User registration components and data**

When a user wishes to register with the trusted intermediary system 10, they are required to complete an account registration process that allows the user to create an account with the SSP service. The account is required to be  
30 populated with appropriate data that can be used to make payments from the SSP service from an online merchant system offering the service.

Once registered, each user has a set of records associated therewith, which stores details of the accounts which they wish to debit when effecting a financial transaction. This could be a bank account, a payment card or other account such as any payment instrument that can be given a unique account reference. The trusted intermediary system 10 comprises presentation components 404 that enable the user to select and add to/remove from the list of payment instruments. In addition the user has address book entries, which hold shipping details; the presentation components 404 enable the user to modify the shipping details. Each user has a profile, which comprises demographic and identification data for the user and can be modified via the presentation components 404, while user transaction data can be displayed for review by the user. As shown in Figure 4 and explained in more detail below, the trusted intermediary system 10 can be implemented as a web server, in which case the presentation components 404 interoperate with the user's browser to allow selection and modification of the user data in the manner just described. However, registration of the user with the trusted intermediary system 10 can be performed via any alternative suitable interface.

Registration can be effected via a number of channels:

- Register via SSP site – the user logs onto the website of the trusted intermediary system 10 and is presented with a registration page designed to capture the user's identity and preferred payment instrument details
- Re-direct from order system – If the user is within the online merchant's order system and wishes to effect payment using the SSP option they will need to register if they have not already done so. The user is re-directed to the registration screens associated with the trusted intermediary system 10 and then re-directed back to the online merchant's system
- Register via an online bank – assuming the trusted intermediary system 10 comprises the necessary integration functionality, the user can

register for the SSP service from within their bank's online account service.

### **User authentication components**

Authentication of a user into the trusted intermediary system 10 for payment transactions can be performed according to any one of the 3 known categories listed below:

**1-factor authentication** - Something the user knows (e.g., a username and password, pass phrase, or personal identification number (PIN))

**2-factor authentication** – As 1 factor authentication, plus, something the user has (e.g., ID card, security token, software token, phone, or cell phone)

**3-factor authentication** – As 2 factor authentication, plus, something the user is or does (e.g., fingerprint or retinal pattern, DNA sequence (there are assorted definitions of what is sufficient), signature or voice recognition, unique bio-electric signals, or another biometric identifier).

An example of a mechanism to enable authentication is the afore-mentioned 3-D Secure service – facilitated by the trusted intermediary system 10, the issuing bank prompts the buyer for a password that is known only to the bank and the buyer. Since the merchant does not know this password and is not responsible for capturing it, it can be used by the issuing bank as evidence that the purchaser is indeed their cardholder.

In one embodiment the trusted intermediary system 10 implements the authentication process. Alternatively the user can login via their online banking details, in which case the user would log into their online banking account, whereupon the banking system software would re-direct the user back to the trusted intermediary system 10. As a further alternative, authentication could involve an account identifying entity, which, based on user-specific input, could act as an intermediary and cooperate with the trusted intermediary system 10 to effect identification of the user's account on behalf of the user.

### **Online merchant data store:**

The trusted intermediary system 10 stores online merchant profile and registration data. These data include an online merchant internet account identifier together with a transactional and network identifier of the merchant

IPSP system 3c with which the online merchant system is registered. These data are held to enable the trusted intermediary system 10 to communicate with the merchant IPSP system 3c on behalf of the online merchant system, and are collectively referred to as merchant IPSP system transmission data, or simply transmission data. In addition the trusted intermediary system 10 comprises a payment authorisation service through which the trusted intermediary system 10 effects payments on behalf of the online merchant. Further, because the trusted intermediary system 10 integrates with many merchant IPSP systems it comprises a plurality of interface formats and protocols. Details of the relevant formats and protocols for each merchant IPSP system are held in the online merchant data store. Thus the afore-mentioned transmission data comprises a mapping of a payment authorisation request emanating from a given online merchant system to an IPSP identifier, a network address and/or network protocols that enable payment authorisation requests to be routed to the relevant merchant IPSP system.

It will therefore be appreciated that registration of any given merchant offering the SSP service involves the merchant specifying the merchant IPSP system to which they subscribe. Conveniently the trusted intermediary 10 can hold a set of records corresponding to active merchant IPSP systems: each set of records can comprise network identifier and required communications protocols for storage in the database DB1 by the trusted intermediary 10. Thus during registration with the SSP the given online merchant can select, e.g. via a drop down list coordinated by the presentation components 404 of the trusted intermediary 10, the merchant IPSP system to which the online merchant has subscribed; the corresponding transmission data (or a link thereto) can then be stored in conjunction with the merchant records held in the database DB1. Accordingly, provided the given online merchant has specified its corresponding merchant IPSP system in the manner just described, then in response to receipt of a payment authorisation request from the merchant system, the trusted intermediary 10 can perform a suitable lookup from the database and retrieve the network identifier, protocol requirements etc. of the corresponding merchant IPSP system.



**Application Programming Interface (API) services adaptor**

The trusted intermediary system 10 comprises an API Services Adaptor, which enables connectivity between the trusted intermediary system 10 and the messaging infrastructure of the payment system 1. The adaptor is configured to manage the fulfillment of the trusted intermediary system 10 requests to external services, such as payment authorisations to merchant IPSP system 3c and to expose a set of the trusted intermediary system 10 services that could be used by external functions such as merchant IPSP system 3c.

**Transaction-specific components and data:**

The trusted intermediary system 10 stores transactional data such as payment authorisations and settlements that are managed by the trusted intermediary system 10. In addition the trusted intermediary system 10 can store audit data associated with users and online merchant online activity as well as general system activity.

**Messaging Services**

The trusted intermediary system 10 is configured with email agents, which compose and transmit emails for the purposes of email address authentication and user activation and purchase order confirmations.

As mentioned above the trusted intermediary system 10 is preferably embodied as a web application server, for example as a J2EE compliant application server 401 which manages and provides access to the common business logic of the platform, and a web server & J2EE servlet engine 403, which acts as the entry point for external HTTP requests to the trusted intermediary system 10 from online merchants and from users' browsers.

The web server and servlet engine 403 comprises presentation components, which expose web services-based payment APIs or API wrappers to online merchant systems. In addition, the web server and servlet engine 403 comprises presentation processing components 404 which are configured to generate and manage the interface to the user, e.g. when the user selects a payment method in the manner described above.

The J2EE Application Server 401 manages all the business logic for the web platform and applications. The business logic comprises functional software components 411a ... 411e, which can be implemented as, for example, Session EJBs (Enterprise Java Beans). These functional groups include, e.g. email processing modules, address validation modules, and fraud and security service modules; in addition the server 401 comprises objects implemented, for example, as EJB 3.0 specified Java objects 411f ... 411h that provide access to static and persistent data stored in DB1 such as user data, audit data and transaction data described above. The trusted intermediary system 10 comprises web services in the form of wrappers that expose the Session EJBs to other elements of the payment system 1. More specifically, the functional software components 411a ... 411e interoperate with external service enablers 405 such as address validation services 415a, email applications (including access to an email server) 415b, 3-D Secure services 415c, account updating services 415d, and fraud services 415e, among others. The application server 401 components 411a ... 411e communicate with the application components 415a ... 415e via a set of APIs, referred to generically as such in relation to parts 413a ... 413e. When implemented as a web server, data between the elements of the payment system 1 (i.e. those shown in Figures 2 and 3) and the trusted intermediary system 10 are transmitted using a secure mechanism, e.g. via the HTTP over Secure Socket Layer protocol (HTTPS).

In the case of the 3-D Secure service functional component 411c, this component uses, or cooperates with, risk-based rules which are invoked in order to determine whether or not the component should be involved in the interactions between the user and the trusted intermediary 10. The rules are typically configured under control of the fraud services 415e, and may, for example, specify that the 3-D Secure method should be invoked when a user registers a payment instrument with the SSP service (to ensure that the user is the legitimate cardholder); for the first transaction that a buyer makes; for transactions exceeding a certain value; for transactions that involve shipping of goods outside of the buyer's home territory; and for certain types of goods and/or services. Other events that may trigger the 3-D Secure service, including

invoking the service for all transactions, will be apparent to one skilled in the art.

Turning to the account updating (AU) functional component 411d and corresponding service 415d provided by the card scheme system 7, the AU component 411d comprises routines for routinely reviewing expiry dates of payment instruments stored in individual user wallets in the database DB1, and submitting requests to the card scheme system 7 with details of users whose payment instruments are due to expire within a specified time window. The AU component 411d subsequently accesses the account updating service 415d and collects a response file generated thereby, and updates payment instruments in the relevant user wallets on the basis of the content of the response file.

The processing steps described above with reference to Figure 3, specifically the steps performed in particular by the trusted intermediary system 10 when interfacing with the various payment entities, will now be described in more detail. Turning to Figure 5, at step S5.1, the user selects SSP payment service as the payment method and submits their selection to the online merchant website. This triggers a request from the online merchant system, specifically retrieval by the online merchant system of the URL corresponding to a sign-in page of the trusted intermediary system 10, and subsequently the sending of a key order plus online merchant fields including a return URL (step S5.3) and the creation of a secure session. Having received the sign-in URL from the trusted intermediary system 10, the online merchant system displays the sign-in page to the user (step S5.5). In one arrangement the sign-in page is implemented as an iFrame, which enables the user to communicate directly with the trusted intermediary system 10 while remaining within the online merchant's online environment. The user enters their sign-in details (step S5.7), and is authenticated according to one of the authentication mechanisms described above (step S5.9); if authentication is successful, the web server and servlet engine 403 sends data content from the user's remote store to the iFrame for display and selection therein (step S5.11). Once the user has selected their payment method from the options within the downloaded remote store contents, the user submits their selected option (step S5.13) to the web server and servlet

engine 403, resulting in a confirmation page being transmitted to the iFrame (step S5.15).

Once the user has confirmed the payment selection and submitted same (step S5.17), the web server and servlet engine 403 sends the payment details to  
5 the online merchant's IPSP system 3c (step S5.19) via a payment authorisation service through which the trusted intermediary system 10 effects payments on behalf of the online merchant. Under certain circumstances the application server 401 invokes a 3-D Secure process responsive to receipt of the payment selection at step S5.17. For example, the application server 401 may invoke 3-D  
10 Secure component 411c, which, on the basis of the content of the payment request message, determines whether or not the user is to be verified by the corresponding issuing bank prior to continuing with the processing of the transaction. In the event that the 3-D Secure component 411c determines the transaction to present a predetermined level of risk (on the basis of the rules  
15 accessible to component 411c), the 3-D Secure component 411c configures a secure communication between the user and a corresponding 3-D Secure issuing bank authentication system 415c. For example, a transaction using Verified by Visa/SecureCode will initiate a redirect to the website of the issuing bank, or will initiate loading of an inline frame session, to authorize the transaction.

20 Assuming the user to be verified, or in cases where verification is deemed unnecessary for the transaction in question, step S5.19 involves creating an authorisation request for receipt by the payment APIs 406, converting the payment authorisation request into the API format of the online merchant's API and transmitting the formatted request to the merchant IPSP system 3c. A  
25 settlement request is also transmitted to the payment APIs 406, which performs conversion of the settlement request into the API format of the online merchant's API and transmits same to the merchant IPSP system 3c. It will be appreciated that the communication may be effected by either single or dual message implementations. These formatting and transmission actions are  
30 recorded in the transaction data store held by the trusted intermediary system 10 corresponding to the online merchant system.

Upon notification of authorisation of the payment request (step S5.21), the web server and servlet engine 403 transmits a return online merchant URL to the iFrame (step S5.23), together with notification of successful authorisation, causing the iFrame to empty, reload with Javascript code from the online merchant system (step S5.25), and thus remove the iFrame and return the user to the online merchant system's website. Finally, the online merchant system's website displays a successful order webpage at step S5.27.

In parallel with steps S5.13-S5.19 the application server 401 can log the user's activity and send same to the audit data store, while sending corresponding system and event information to a third party fraud notification system (this is represented by one of the common service enablers 415e shown in Figure 4). The fraud notification system comprises, but is not limited to, a fraud risk engine, which performs analysis of same so as to generate a risk score and a recommended action for the transaction; suitable fraud notification systems such as that provided by RSA™ in their fraud prevention suite are known and will not be described in any more detail herein. The risk score and action are stored in the database DB1, in conjunction with the other transaction details for the online merchant and the user.

The above embodiments are to be understood as illustrative examples of the invention. Further embodiments of the invention are envisaged. For example, whilst in the foregoing examples the trusted intermediary system 10 is described as receiving payment requests from online merchant systems, the intermediary 10 could additionally or alternatively receive payment requests from a merchant IPSP system in the third type of arrangement described in the background section in cases where such merchant IPSP systems have been modified to offer SSP as a payment option.

Further, whilst preferred embodiments make use of iFrame web technology to navigate the user to different websites, it will be appreciated that standard web redirection can instead be employed. In such alternative arrangements the user's browser will be navigated away from and back to the SSP website, depending on the entity (or rather the URL corresponding thereto) with which the user's browser is communicating at any point in time. For

example, during authentication and/or account selection by the user, the user's browser may be redirected by the SSP website to a website provided by, or on behalf of, the user's issuing bank, and once the user authentication and/or account selection is completed, the user's browser may be redirected by the issuer bank website back to the SSP website.

In the foregoing embodiments the trusted intermediary system 10 is described as storing shipping details in the set of user records: to this extent the trusted intermediary system 10 can be viewed as providing part of the functionality associated with a checkout tool: the relevant fields stored in the database DB1 could be available through the interface to enable merchant systems to reference the data during the checkout process and populate fields appropriately. However, it is to be understood that this is an optional aspect of the intermediary 10. Indeed, the checkout functionality could be provided by the online merchant system 1c, in which case the trusted intermediary system 10 would simply perform the role of a payment tool, and the database DB1 would then store fewer items of user-specific information.

In the foregoing, the term "system", when applied to entities such as the merchant system, the merchant IPSP system, the trusted intermediary system and other entities, should be understood to mean a data processing function, provided at one or more physical sites, connected to other data processing functions via data communications links. Each function may be provided by a single data processing node, for example a server computer, or a set of data processing nodes providing fail-over backup to each other, such as a cluster of server computers, and/or a set of interconnected data processing nodes providing different modular sub-functions with respect to other members of the set, for example an interworking set of different server computers.

As will be appreciated from the foregoing, communications between the various entities comprising the payment system 1 preferably proceed via a data communications network such as the Internet. Each of the entities of the payment system 1 (the issuing bank; the trusted intermediary; the acquiring bank processor; the merchant IPSP systems; and the online merchant systems) is

identifiable via a network identifier such as an Internet Protocol (IP) address or other suitable identifier.

Accordingly the communications network can comprise a network comprising one or more technologies i.e. a hybrid communication network; for example the network can comprise the Internet in conjunction with the Public Switched Telephone Network (PSTN) and/or a mobile communication network capable of supporting, for example, one or more of the following communication protocols: GSM (Global System Mobile), WCDMA (Wideband Code Division Multiple Access), GPRS (General Packet Radio Service). In addition to or instead of the mobile communication network, a local area network such as a Wireless Local area network (WLAN) or BlueTooth® (BT) and/or other technologies such as WiMax can be used to carry part of the payment authorisation request and response messages. In this way, users can interact with the online merchant systems using portable, remote devices. The data communications network can be arranged to support generic Internet access using any transport methods. In addition, or as an alternative, to sending confirmation messages as email messages, payment confirmation messages can be transferred as SMS-messages (Short Message Service), MMS-messages (Multi Media Service), Wireless Application Protocol (WAP) pages, Internet pages, HTML (Hypertext Mark-up Language) pages, XHTML (eXtended HTML) pages, or IP-datagrams (Internet Protocol).

It is to be understood that any feature described in relation to any one embodiment may be used alone, or in combination with other features described, and may also be used in combination with one or more features of any other of the embodiments, or any combination of any other of the embodiments. Furthermore, equivalents and modifications not described above may also be employed without departing from the scope of the invention, which is defined in the accompanying claims.

**CLAIMS:**

1. A method of processing payment authorisation requests for payment transactions to be conducted via a data communications network on behalf of online merchants, the payment authorisation requests being conducted as a result of orders  
5 by financial instrument holders via a plurality of different online merchant systems, each of said online merchants having an online merchant identity, and each of said online merchants being associated with one of a plurality of acquiring banks,  
wherein the method is conducted by a trusted central intermediary system which is arranged to transmit payment authorisation requests to each of a plurality  
10 of online merchant Internet Payment Service Provider (IPSP) systems,  
each of said merchant IPSP systems being arranged to transmit payment authorisation requests to at least one of a plurality of acquiring bank payment processor systems, each of said plurality of acquiring bank payment processor systems being responsible for processing payment authorisations for at least one of  
15 said acquiring banks, and  
the trusted central intermediary system comprises a database configured to store merchant IPSP system transmission data for enabling the transmission of payment authorisation request data to a selected merchant IPSP system, and merchant profile data comprising, for each of the online merchants, an online  
20 merchant identity together with an identifier of a merchant IPSP system with which the online merchant is registered,  
the method comprising:  
receiving from a first online merchant system, responsible for originating  
payment authorisation requests for a first online merchant, a payment authorisation  
25 request relating to authorisation of a payment transaction, said received payment authorisation request being initiated as a result of a financial instrument holder conducting an order via the first online merchant system, the received payment authorisation request comprising an online merchant identity associated with the first online merchant;



in response to receiving said request:

a) generating a payment authorisation request comprising transaction data including:

5 i) a financial instrument identity to be used in the payment transaction by the financial instrument holder; and

ii) an online merchant identity, associated with the first online merchant, as the payment transaction beneficiary; and

iii) one or more transaction details including a payment amount; and

10 b) selecting the merchant IPSP system with which the first online merchant is registered by performing a lookup in the database using the online merchant identity associated with the first online merchant;

c) retrieving merchant IPSP system transmission data associated with the selected merchant IPSP system; and

15 d) on the basis of the retrieved merchant IPSP system transmission data, converting the payment authorisation request into the Application Programming Interface (API) format of the online merchant's API, and transmitting said formatted payment authorisation request to the selected merchant IPSP system, wherefrom a further payment authorisation request may be generated and  
20 transmitted to an acquiring bank payment processor system responsible for processing payment authorisations for the acquiring bank with which the first online merchant is associated.

2. A method according to claim 1, wherein the trusted central  
25 intermediary system receives a payment authorisation response from said selected merchant IPSP system, and in response thereto transmits a payment authorisation response to said first online merchant system.

3. A method according to claim 1 or claim 2, wherein the first online merchant is an online merchant account holder with the acquiring bank with which it is associated.

5 4. A method according to any one of claims 1 to 3, wherein the online merchant identity included in the generated authorisation request is generated on the basis of the received online merchant identity.

10 5. A method according to claim 1, wherein at least some of said plurality of merchant IPSP systems transmit payment authorisation requests to more than one of said plurality of acquiring bank payment processor systems.

15 6. A method according to any one of claims 1 to 5, wherein the method comprises receiving data indicating a selection, by the financial instrument holder, between a plurality of different financial instruments for use in the payment transaction, and retrieving a financial instrument identity to be used in the generated payment authorisation request on the basis of said indicated selection.

20 7. A method according to any one of claims 1 to 6, wherein the trusted central intermediary system provides a registration interface for a financial instrument holder whereby the financial instrument holder can provide a financial instrument identity for registration with said trusted central intermediary system as stored registration data, the method comprising the step of authenticating a financial instrument holder and, in response thereto, retrieving a registered financial instrument identity to be used in the generated payment authorisation request from  
25 said stored registration data.

8. A method according to any one of claims 1 to 7, wherein the step of retrieving merchant IPSP system transmission data comprises retrieving a network

address for the selected merchant IPSP system, and the step of transmitting said generated payment authorisation request to the selected merchant IPSP system comprises transmitting said generated payment authorisation request on the basis of the retrieved network address.

5

9. A method according to any one of claims 1 to 8, wherein said trusted central intermediary system cooperates with a plurality of issuing authentication systems, each being responsible for conducting authentication for a different issuing bank, the method comprising the step of selectively communicating with a  
10 respective issuing authentication system so as to verify the identity of the financial instrument holder.

10. A method according to claim 9, comprising transmitting data to said financial instrument holder enabling said financial instrument holder to perform  
15 authentication with respect to a said issuing authentication system, and receiving verification response data from said issuing authentication system in response to verification of the financial instrument holder by the corresponding issuing bank.

11. A method according to claim 9 or claim 10, in which verification of  
20 the financial instrument holder is performed in accordance with the 3-D Secure messaging protocol.

12. A method according to any one of claims 1 to 11, wherein said trusted central intermediary system cooperates with a plurality of issuing  
25 authentication systems, each being responsible for conducting authentication for a different issuing bank, the method comprising the step of retrieving a financial instrument identity to be used in the generated payment authorisation request on the basis of the authentication of the instrument holder by a selected one of said plurality of issuing authentication systems.

13. A method according to claim 12, comprising transmitting data to said financial instrument holder enabling said financial instrument holder to perform authentication with respect to a selected authentication system, and  
5 receiving authentication response data from said selected authentication system in response to authentication of the financial instrument holder by the selected issuing authentication system.

14. A method according to claim 12 or claim 13, comprising receiving  
10 data indicating a financial instrument identity to be used in the generated payment authorisation request from said selected issuing authentication system in response to authentication of the financial instrument holder by the selected issuing authentication system.

15. A method according to any one of claims 1 to 14, wherein said  
15 financial instrument identity comprises a Primary Account Number (PAN) associated with said financial instrument.

16. A method according to claim 15, wherein said PAN comprises a  
20 credit card number or debit card number.

17. A method according to any one of claims 1 to 16, wherein the  
selected merchant IPSP system provides payment transaction settlement for an online merchant account through which said payment transaction is conducted, on  
25 behalf of the first online merchant.

18. A method according to any one of claims 1 to 17, wherein the  
merchant IPSP system provides payment transaction history for the first online

merchant, said payment transaction history being accessible by the first online merchant via an online merchant interface provided by the merchant IPSP.

19. A method according to any one of claims 1 to 18, wherein the trusted  
5 central intermediary system provides a registration interface for the first online merchant whereby the first online merchant can register a merchant IPSP system with which the first online merchant is associated.

20. A method according to any one of claims 1 to 19, wherein the trusted  
10 central intermediary system receives and processes payment authorisation requests for payment transactions of a first type originating from the first online merchant system, and in response thereto to transmit a generated payment authorisation request to the selected merchant IPSP system, and wherein said selected merchant IPSP system receives and processes payment authorisation requests for payment  
15 transactions of a different type originating from the first online merchant system, said payment authorisation requests for payment transactions of a different type not being processed via said central intermediary system.

21. A method according to claim 20, wherein said payment authorisation  
20 requests for payment transactions of a first type originating from the first online merchant system do not include said financial instrument identity and said payment authorisation requests for payment transactions of said different type originating from the first online merchant system include a financial instrument identity collected by the online merchant system during order processing of payment  
25 transactions of said different type.

22. A method according to claim 21, wherein the financial instrument identity collected by the online merchant system during order processing of

payment transactions of said different type comprises a credit card number or a debit card number.

23. A trusted intermediary system in communication with a plurality of  
5 online merchant systems and a plurality of merchant IPSP systems, said trusted intermediary system being arranged to:

receive from a first online merchant system, responsible for originating  
payment authorisation requests for a first online merchant, a payment authorisation  
request relating to authorisation of a payment transaction, said received payment  
10 authorisation request being initiated as a result of a financial instrument holder  
conducting an order via the first online merchant system, the received payment  
authorisation request comprising an online merchant identity associated with the  
first online merchant;

in response to receiving said request:

15 a) generating a payment authorisation request comprising transaction  
data including:

i) a financial instrument identity to be used in the payment  
transaction by the financial instrument holder; and

20 ii) an online merchant identity, associated with the first  
online merchant, as the payment transaction beneficiary; and

iii) one or more transaction details including a payment  
amount; and

25 b) selecting the merchant IPSP system with which the first online  
merchant is registered by performing a lookup in the database using the online  
merchant identity associated with the first online merchant;

c) retrieving merchant IPSP system transmission data associated with  
the selected merchant IPSP system; and

d) on the basis of the retrieved merchant IPSP system transmission  
data, converting the payment authorisation request into the Application

Programming Interface (API) format of the online merchant's API, and transmitting said formatted payment authorisation request to the selected merchant IPSP system, wherefrom a further payment authorisation request may be generated and transmitted to an acquiring bank payment processor system responsible for processing payment authorisations for the acquiring bank with which the first online merchant is associated.

24. A payment authorisation system for processing payment authorisation requests in respect of payment transactions to be conducted via a data communications network on behalf of online merchants, the payment authorisation requests being conducted as a result of orders by financial instrument holders via a plurality of different online merchant systems, each of said online merchants having an online merchant identity and each of the online merchants being associated with one of a plurality of different acquiring banks,

wherein the payment authorisation system comprises a trusted central intermediary system arranged to communicate with a plurality of different online merchant Internet Payment Service Provider (IPSP) systems and with a plurality of said online merchants, the trusted central intermediary system being arranged to transmit payment authorisation requests to each of the plurality of different online merchant Internet Payment Service Provider (IPSP) systems,

wherein each of said merchant IPSP systems is arranged to transmit payment authorisation requests to at least one of a plurality of acquiring bank payment processor systems, each of said plurality of acquiring bank payment processor systems being responsible for processing payment authorisations for at least one of said acquiring banks,

wherein the trusted central intermediary system comprises a database configured to store merchant IPSP system transmission data for enabling the transmission of payment authorisation request data to a selected merchant IPSP system, and merchant profile data comprising, for each of the online merchants, an

online merchant identity together with an identifier of a merchant IPSP system with which the online merchant is registered,

wherein, responsive to a payment authorisation request relating to authorisation of a payment transaction from a first online merchant system, said  
5 received payment authorisation request being initiated as a result of a financial instrument holder conducting an order via the first online merchant system, the first online merchant system being responsible for originating payment authorisation requests for said first online merchant, and the received payment authorisation request comprising an online merchant identity associated with the first online  
10 merchant,

the trusted intermediary system is arranged to:

a) generate a payment authorisation request comprising transaction data including:

i) a financial instrument identity to be used in the payment  
15 transaction by the financial instrument holder; and

ii) an online merchant identity, associated with the first online merchant, as the payment transaction beneficiary; and

iii) one or more transaction details including a payment amount; and

20 b) select the merchant IPSP system with which the first online merchant is registered by performing a lookup in the database using the online merchant identity associated with the first online merchant;

c) retrieve merchant IPSP system transmission data associated with the selected merchant IPSP system; and

25 d) on the basis of the retrieved merchant IPSP system transmission data, convert the payment authorisation request into the Application Programming Interface (API) format of the online merchant's API, and transmit said formatted payment authorisation request to the selected merchant IPSP system, wherefrom a further payment authorisation request may be generated and transmitted to an



acquiring bank payment processor system responsible for processing payment authorisations for the acquiring bank with which the first online merchant is associated.

- 5 25. A computer-readable medium having recorded thereon instructions to be executed by a processor to carry out a method as claimed in any one of claims 1 to 22.

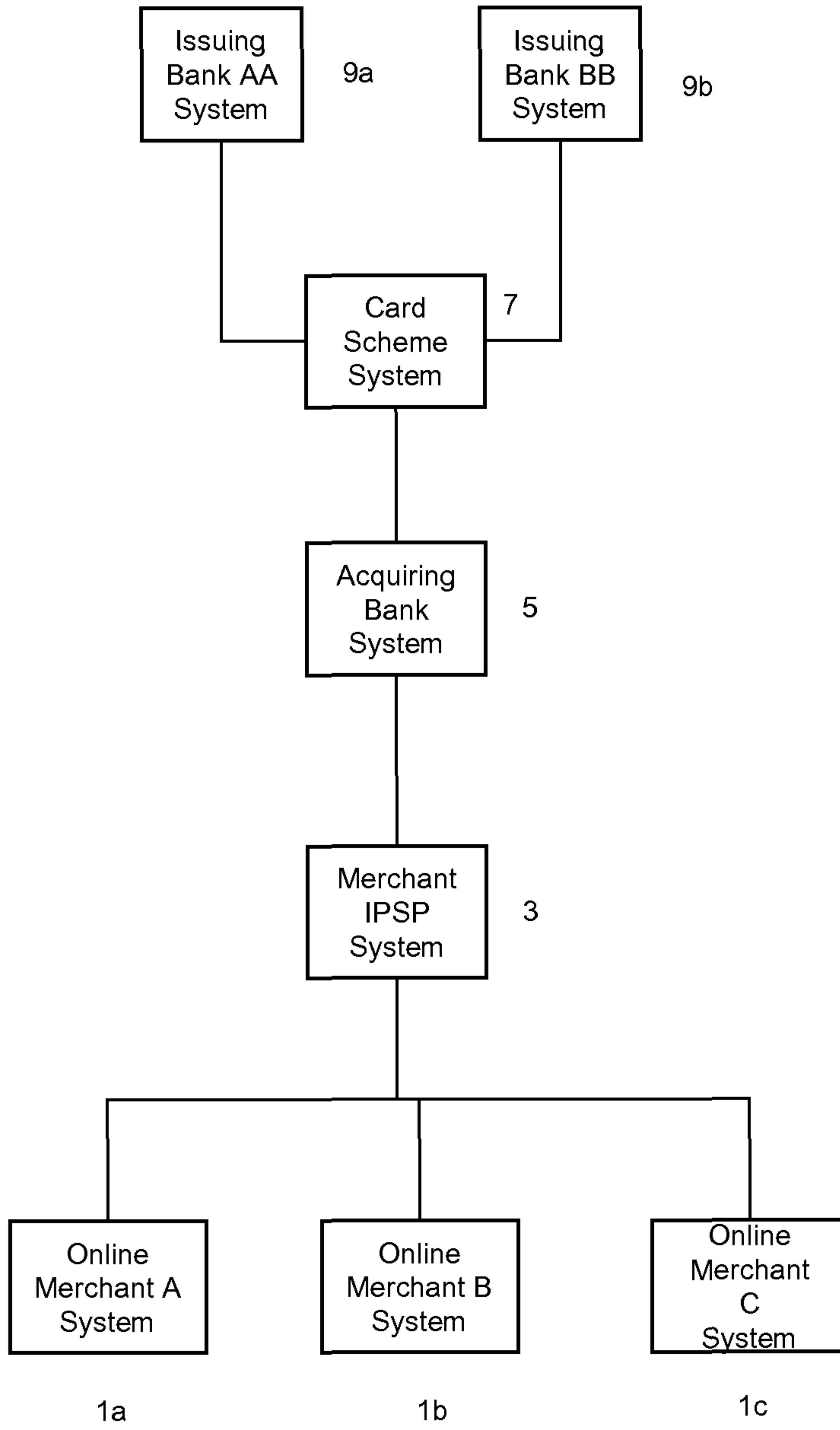


Figure 1

*PRIOR ART*

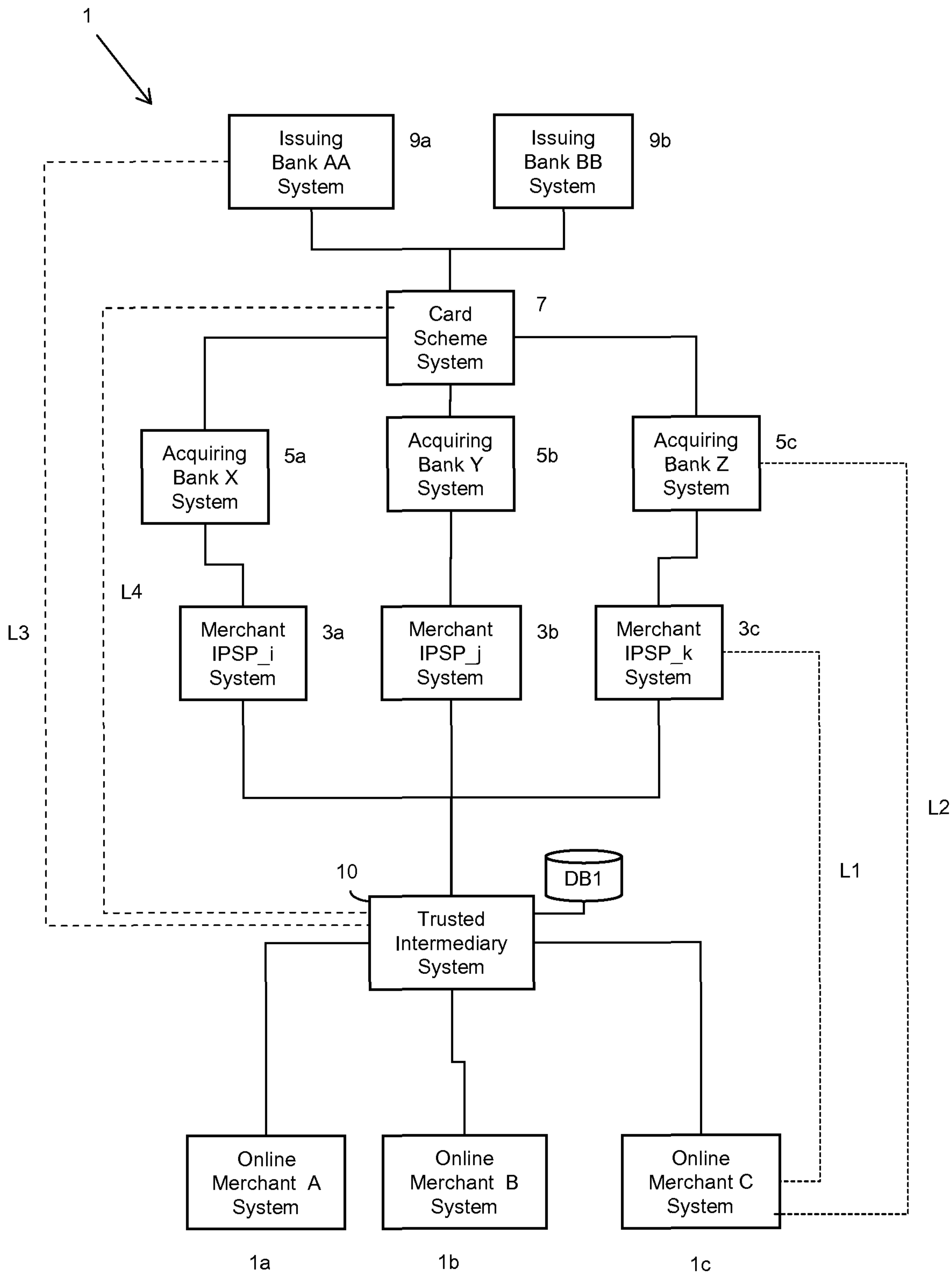


Figure 2

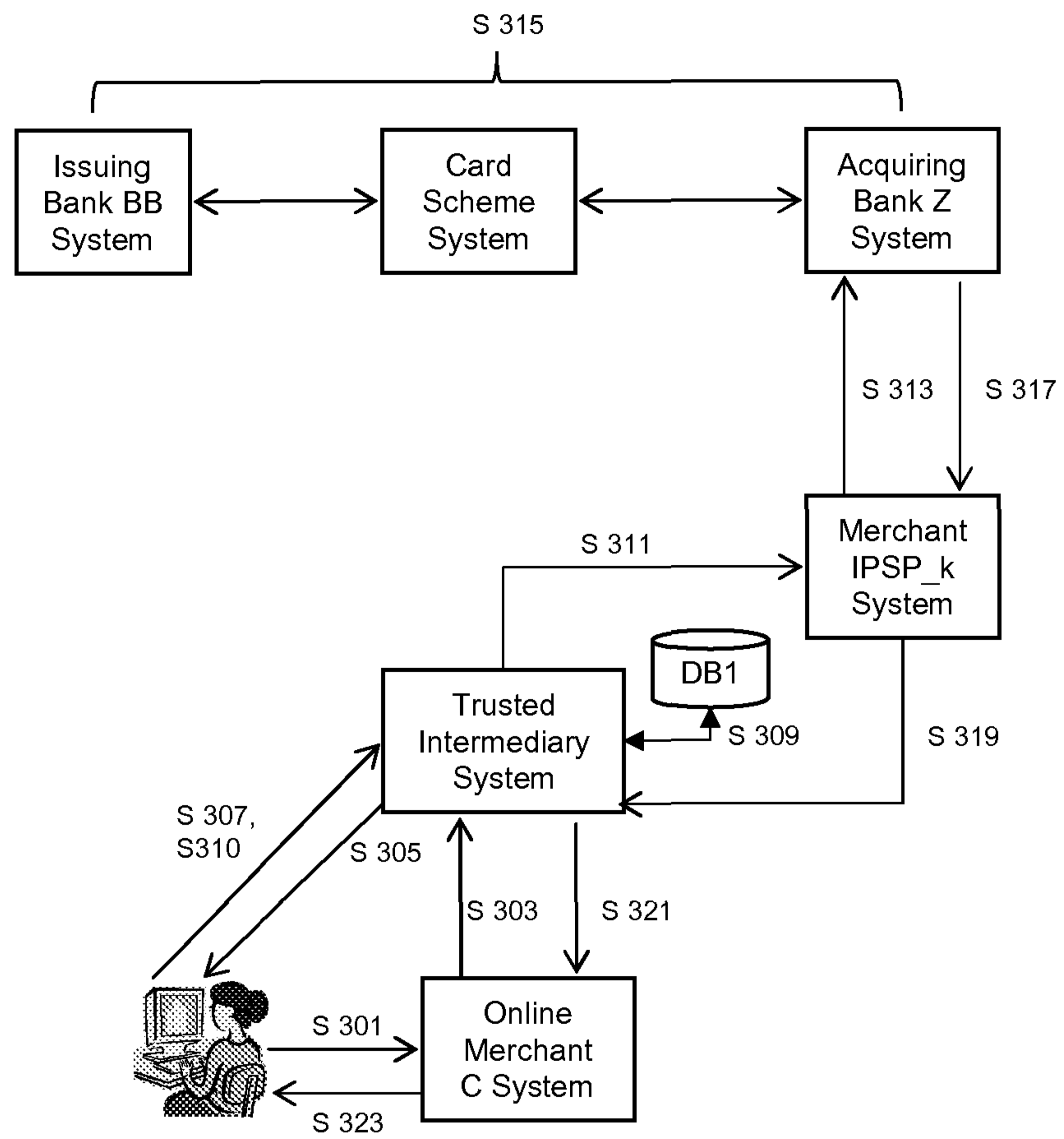


Figure 3

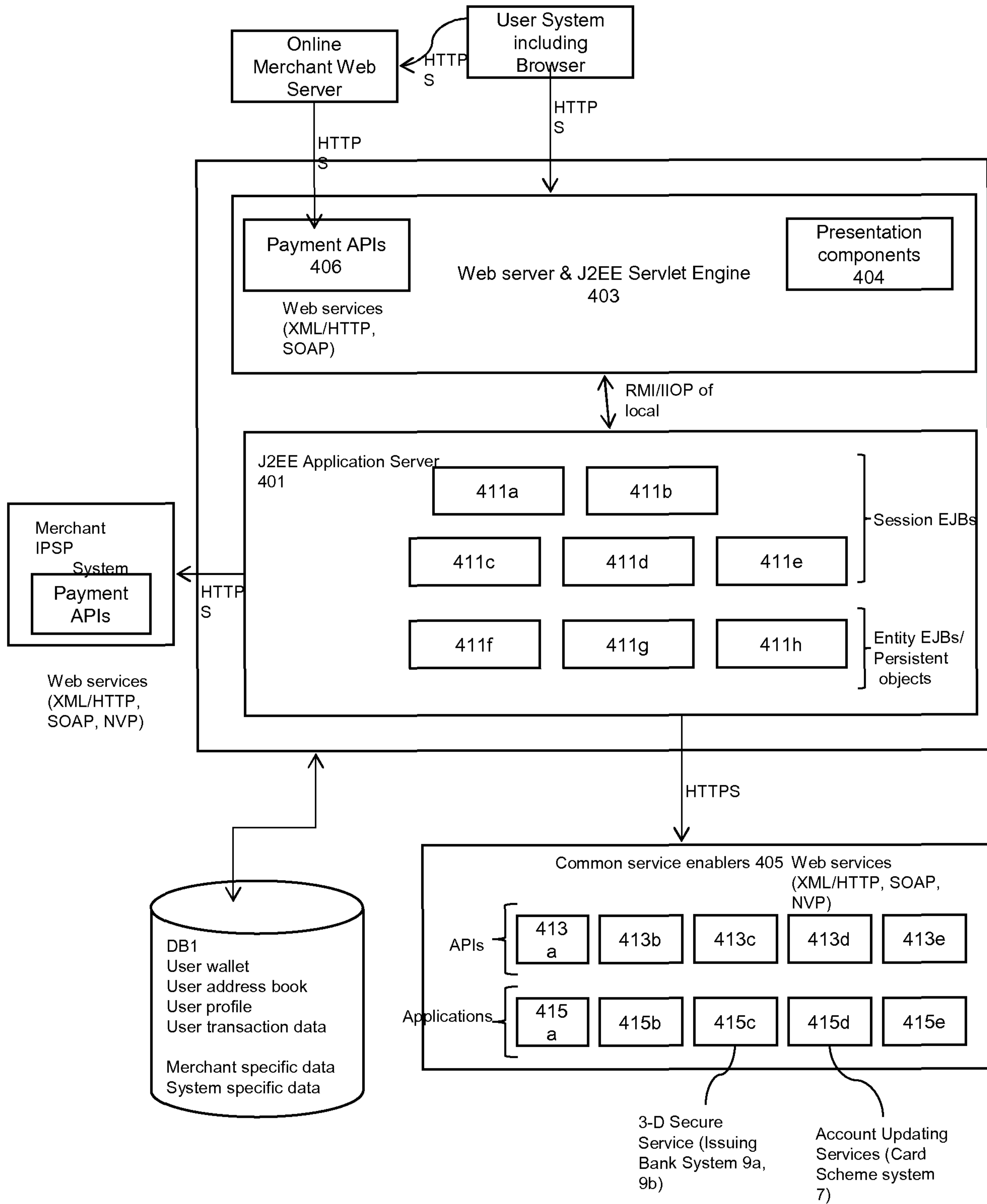


Figure 4

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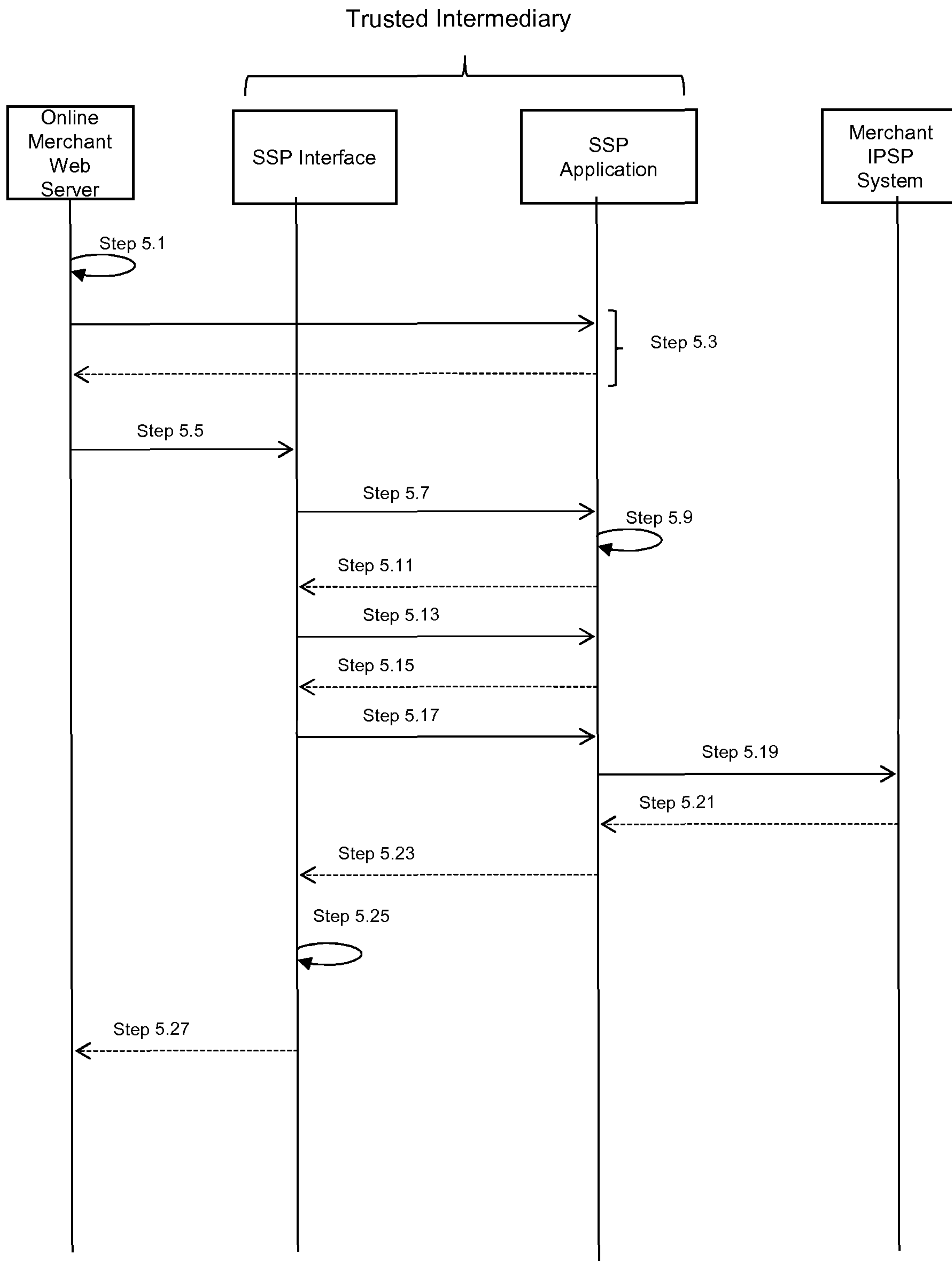


Figure 5

