

ENHANCED PAYMENT PROCESSING

CROSS-REFERENCE TO RELATED APPLICATION

This application claims the benefit of, and priority to, U.S. Non-Provisional Application No. 16/505,053 filed on July 8, 2019. The entire disclosure
5 of the above-referenced application is incorporated herein by reference.

BACKGROUND

Payment cards such as credit cards and debit cards are widely used for most forms of financial transactions. Currently, very few suppliers in the business to business space accept card payments. The process of accepting and processing
10 payment cards is cumbersome for the supplier. Purchase orders, invoices, and bank transfers dominate as the default payment method and require zero process effort from the supplier. However, many businesses, including buyers, would like to use commercial card products in order to enhance their working capital.

BRIEF SUMMARY

15 Enhanced payment processing is provided. The described enhanced payment processing enables a card payment on the buyer side to end up as a bank transfer to the supplier. The described enhanced payment processing can enable business to business payments to be made on a buyer's payment card while facilitating direct to bank account payments to suppliers.

20 An enhanced payment processing service can receive a request from a first party to make a payment to a second party. The request can include one or more transactions, with each transaction comprising at least a second party identifier and an amount of the payment. In response to receiving the request, the enhanced payment processing service can obtain virtual card number information for each transaction.
25 For each transaction, the enhanced payment processing service can communicate the virtual card number information and a request for an enhanced payment processing transfer to an enhanced payment processing bank. The request for the enhanced payment processing transfer is a request for an electronic payment transfer from the enhanced payment processing bank to a financial institution associated with the
30 second party identifier according to a processing result of the virtual card number

information. The request for the enhanced payment processing transfer comprises the second party identifier and the amount of the payment.

5 This Summary is provided to introduce a selection of concepts in a simplified form that are further described below in the Detailed Description. This Summary is not intended to identify key features or essential features of the claimed subject matter, nor is it intended to be used to limit the scope of the claimed subject matter.

BRIEF DESCRIPTION OF THE DRAWINGS

10 **Figure 1** illustrates an example conventional electronic payment process.

Figure 2 illustrates an example conventional payment card process.

Figures 3A and 3B illustrate example enhanced payment processing according to example embodiments of the invention.

15 **Figure 4** shows an example process flow diagram for providing enhanced payment processing according to an embodiment of the invention.

Figure 5 illustrates components of a computing system that may be used in certain embodiments described herein.

DETAILED DESCRIPTION

20 Enhanced payment processing is provided. The described enhanced payment processing enables a card payment on the buyer side to end up as a bank transfer to the supplier. The described enhanced payment processing can enable business to business payments to be made on a buyer's payment card while facilitating direct to bank account payments to suppliers.

25 The described enhanced payment processing solves the barrier to businesses using commercial payment card products to pay their suppliers. The described enhanced payment processing allows a buyer to pay any supplier having a bank account using a payment card. Advantageously, there is no requirement that the supplier accept payment cards in order for a buyer to pay using a payment card. The enhanced payment processing effectively removes the need for card acceptance by the
30 supplier.

Through the enhanced payment processing, buyers having an enhanced payment processing account with an enhanced payment processing bank can enhance

working capital by allowing card payments to be made to the enhanced payment processing bank rather than to the supplier. The enhanced payment processing bank then pays the supplier on the buyer's behalf. Advantageously, rather than the funds leaving the buyer's account the same day or soon after, the buyer receives a full
 5 statement cycle (plus the payment terms with the supplier) to pay the supplier.

An "enhanced payment processing account" refers to an account allowing a buyer to make a direct bank account payment to a supplier through a payment card.

An "enhanced payment processing bank" refers to a financial
 10 institution through which the buyer has an enhanced payment processing account. The enhanced payment processing bank utilizes a merchant system and a payment transfer system in order to allow the buyer to make the direct bank account payment to the supplier through the payment card.

"Business to business" (B2B) refers to a type of commerce transaction
 15 that is based on the exchange of products and services from one business to another.

"Working capital" refers to capital available to a business in the short term, calculated by current assets minus current liabilities. This capital can be used for things such as short-term debt, additional inventory, or expansion.

"Automated clearing house" (ACH) refers to a computer-based
 20 clearing house and settlement facility established to process the exchange of electronic transactions between participating financial institutions.

"Faster payments service" (FPS) refers to a banking initiative that allows for relatively fast bank transfers for payments less than £250,000.

A "payment instruction file" (PIF) refers to a file used to execute a
 25 bank transfer, including requisite information for the associated type of bank transfer (e.g., NACHA for ACH payments).

A "virtual card number" (VCN) refers to a credit card number not associated with a physical payment card. VCNs are typically used for online purchases and may be for single-use transactions. The VCN can include a unique card
 30 number, an expiration date, a card security code, and a set amount of payment.

Advantageously, the use of a VCN protects both the consumer and the bank. VCNs can protect the consumer against fraudulent charges by limiting the exposure of the active card details. VCNs can protect banks against chargebacks.

A “merchant” refers to a provider of goods or services in exchange for payment. The merchant can be physically present at the sale or remote, such as an online retailer. An “acquirer” refers to a party that processes payments on behalf of the merchant in a payment card transaction. The acquirer can be a bank or other
 5 institution associated with the merchant.

An “issuer” refers to a bank or other institution that provides payment cards to the cardholder. A “payment network” refers to a network that routes transaction information to the appropriate issuer. An example of a payment network is the one operated by Mastercard International Incorporated.

10 Figure 1 illustrates an example conventional electronic payment process. Referring to Figure 1, a buyer **105**, having an account with buyer’s bank **110**, can make a payment to a supplier **120**, having an account with a different bank (e.g., supplier’s bank **115**). The payment may be any suitable electronic bank-to-bank payment. For example, the electronic payment may be an ACH payment or an FPS
 15 payment.

The buyer **105** can initiate an electronic payment to the supplier **120** through a request with the buyer’s bank **110**, as shown in (step **1**). The buyer **105** can provide account details of the supplier **120**. The details of the transaction can include, but are not limited to, an amount of the payment, a destination account address, and
 20 buyer’s account. The destination account address and buyer’s account can be represented by, for example, sort codes or routing numbers. The request may be made, for example, using a mobile device or through online or telephone banking. This request can be in the form of a payment instruction file, for example in NACHA file format for an ACH transfer.

25 After the request is received by the buyer’s bank **110**, the buyer’s bank **110** may initiate an electronic bank transfer to the supplier’s bank **115**, as shown in (step **2**).

The electronic bank transfer may be done according to a variety of payment clearing systems, including ACH or FPS. The execution of the bank transfer
 30 differs depending on the type of payment clearing system used. For example, in ACH, an intermediary system is used to ensure the payment goes through according to terms of the request. In this scenario, money is sent from the buyer’s bank **110** to the intermediary system. After the intermediary system ensures that the amount was sent, the intermediary system can send payment to the supplier’s bank **115**.

After acknowledging receipt of the electronic payment, and thus finalizing the ACH bank transfer, the money can be moved internally to a bank account associated with the supplier **120**. Thus, the supplier's bank **115** makes the funds available to the supplier **120**, as shown in (step **3**).

5 Figure 2 illustrates an example conventional payment card process. Referring to Figure 2, in conventional payment card processes, there can be communication between a merchant **210**, an acquirer **215**, a payment network **220**, and an issuer **225**. These communications can include payment card authorization, clearing, and settlement.

10 A process of payment card authorization can begin with a customer providing a form of payment to purchase goods or services. In the event that the form of payment is a credit card, either a physical card or a contactless card (*e.g.*, hosted on a mobile device, and available on an e-wallet), a point-of-sale (POS) terminal for the merchant **210** can be used to obtain the information for payment. The POS system can
15 extract information about the form of payment such as the credit card number, confirmation code, and expiration date, and can also record information about the purchase, such as location, amount, goods type, and a form of verification provided. This information can be provided to an acquirer **215** associated with the merchant **210** as shown in (step **1**). The acquirer **215** can, in turn, provide the information to the
20 payment network **220** associated with the form of payment as shown in (step **2**).

 The payment network **220** can identify an issuing bank, or issuer **225**, of the customer's form of payment. The transaction can be logged to aid in later processes, such as clearing and settlement. When the payment network **220** identifies the issuer **225**, the payment network **220** can send some of the payment information
25 and request authorization and/or preauthorization on the payment method, as shown in (step **3**).

 The issuer **225** can respond to the requested authorization or preauthorization. Authorization can entail ensuring that a transaction is legitimate, such as by checking the provided verification, location, and amount. For example, a
30 provided form of verification can be compared against previously given verification, including biometrics, to determine if the customer is the legitimate cardholder. Similarly, the issuer **225** can compare the location of the merchant **210** against typical spending locations for the cardholder to detect fraudulent charges. as another measure, the issuer **225** can determine that a purchase is likely to be too high to be

legitimate and flag the purchase as possibly fraudulent. The authorization can also check to see if the card is currently locked or suspended. Pre-authorization can entail determining that a customer has sufficient credit to make the transaction. A credit card pre-authorization is a temporary hold on the funds that last for a period of time (e.g.,
 5 five days). During the temporary hold, the cardholder cannot spend the money anywhere else, but the charge may not actually show up on their credit card statement. After one or more of these checks are performed, the issuer **225** can accept the transaction and forward a signal of success or failure back to the payment network **220** as shown in (step 4).

10 Once the signal is received, the payment network **220** can forward the signal to the acquirer **215** as shown in (step 5). The acquirer **215** can then forward the signal back to the merchant **210** as shown in (step 6) to confirm that the transaction has been accepted. Later on, settlement and clearing can occur. In clearing, the payment information can be double checked for accuracy. In settlement, the issuer
 15 **225** can transfer funds to the payment network **220**; the payment network **220** can then transfer the funds to the acquirer **215**. Once the acquirer **215** receives the funds, the funds can be made available to the merchant **210**.

 Unlike the conventional payment process, the described enhanced payment processing enables a credit payment to be received as a bank to bank funds
 20 transfer.

 Figures 3A and 3B illustrate example enhanced payment processing according to example embodiments of the invention. Referring to Figure 3A, in the illustrated example payment process using enhanced payment processing there can be communication between a supplier **302**, a buyer **304**, an enhanced payment
 25 processing service **306**, an enhanced payment processing bank **308**, and a supplier bank **310**. The enhanced payment processing bank **308** is a financial institution through which the buyer **304** has an enhanced payment processing account.

 The payment process using the enhanced payment processing is initiated when the supplier **302** provides an invoice to the buyer **304**, as shown in
 30 (step 1). The invoice can be, for example, a PIF and include multiple transactions. The invoice includes a supplier identifier and an amount for each transaction. The supplier identifier can include information used to address the payment for the supplier (e.g., indicates payment information for the supplier). The supplier identifier can include,

for example, an account number of the supplier, sort code of the supplier, or a payment address of the supplier.

In some cases, the invoice may be provided by the supplier **302** to the buyer **304** through email or as a physical paper. In some cases, the invoice may be provided by the supplier **302** through an online payment system. In this case, the invoice may be digitally uploaded or manually entered by the supplier **302**. The payment system may be run by the supplier **302** or the buyer **304**.

The buyer **304** can communicate a request to make a payment to the supplier **302** to the enhanced payment processing service **306**, as shown in (step 2). The request can include payment information, such as one or more transactions. Each transaction can include at least the supplier identifier and the amount of the payment.

In some cases, the request may include the invoice provided by the supplier **302**. The buyer **304** can communicate the request through any suitable payment interface, such as through a payment portal. For example, the buyer **304** may upload the invoice to the enhanced payment processing service **306** through a payment portal. The payment portal may be accessed through a separate enhanced payment processing application or through an existing bank application.

In some cases, step 1 and step 2 may be a single step (e.g., the invoice is transferred directly to the enhanced payment processing service **306**). For example, in cases where the invoice is provided through a payment system, the payment system can directly communicate, upon request of the buyer **304**, to the enhanced payment processing service **306**.

The enhanced payment processing service **306** can obtain VCN information for each transaction received with the request for the enhanced payment processing transfer described in step 2. Each obtained VCN information is unique and associated with one transaction. The VCN information can include a unique virtual card number, an expiration date, a card security code, and a set amount of payment. The VCN information is linked to the enhanced payment processing account of the buyer **304**.

The enhanced payment processing service **306** can obtain VCN information for each transaction in a variety of ways. In some cases, the enhanced payment processing service **306** can generate the VCN information. In some cases, the enhanced payment processing service **306** can communicate with a separate

service to request the VCN information; and receive the VCN information from the separate service.

Advantageously, the use of a VCN protects both the consumer and the bank. VCNs can protect the consumer against fraudulent charges by limiting the exposure of the active card details. VCNs can protect banks against chargebacks.

The enhanced payment processing service **306** can communicate, for each transaction, the VCN information and a request for an enhanced payment processing transfer to the enhanced payment processing bank **308**, as shown in step 3. The request for the enhanced payment processing transfer can be a request for an electronic payment transfer from the enhanced payment processing bank **308** to a financial institution associated with the supplier identifier (e.g., the supplier bank **310**), such as an ACH payment or an FPS payment.

The request for the enhanced payment processing transfer can include the supplier identifier and the amount of the payment. In some cases, the request can include any additional information required to make an electronic payment to the supplier **302**.

The VCN information and the request for the enhanced payment processing transfer may be communicated in the same or separate requests. In addition, the enhanced payment processing service **306** can, in some cases, send multiple transactions (and corresponding VCNs) in one communication to the enhanced payment processing bank **308**.

The enhanced payment processing bank **308** can identify whether there is available credit for the buyer **304** using the VCN received from the enhanced payment processing service **306**. Enhanced payment processing bank **308** can identify whether there is available credit for the buyer **304** using a conventional payment card process, such as that described with respect to Figure 2, but where the enhanced payment processing bank **308** functions as both the merchant and the issuer.

Once the enhanced payment processing bank **308** identifies that there is available credit, the enhanced payment processing bank **308** can affect electronic payment to the bank account of the supplier **302** using the seller identifier and the amount of the payment received from the enhanced payment processing service **306**, as shown in (step 4). That is, the enhanced payment processing bank **308** can credit the supplier bank **310** with the electronic payment funds, such as described with

respect to step 2 of Figure 1. The electronic payment can be any electronic bank to bank payment such as an ACH payment or an FPS payment.

Upon receiving the electronic payment funds described in step 4, the supplier bank **310** makes the electronic payment funds available to the supplier **302**.

- 5 The supplier **302** can then have immediate/near immediate access to the deposited funds.

Referring to Figure 3B, in the illustrated example payment process using enhanced payment processing there can be communication between a supplier **302**, a buyer **304**, an enhanced payment processing service **306**, an enhanced payment processing bank **308**, and a supplier bank **310**. Figure 3B provides a more detailed description of the example payment process using enhanced payment processing described with respect to the enhanced payment processing bank **308**.

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In the described payment process using enhanced payment processing, the enhanced payment processing bank **308** can include functionality to act as the issuer of the enhanced payment processing payment card associated with the enhanced payment processing account of the buyer **304**, the merchant, and the payment transferrer. Indeed, the enhanced payment processing bank **308** can include a merchant system **320**, a payment transfer system **322**, and an issuer system **330**. The enhanced payment processing bank **308** can communicate with an acquirer **332** and a payment network **334**.

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Similar to the payment process using enhanced payment processing described with respect to Figure 3A, the process is initiated when the supplier **302** provides an invoice to the buyer **304**, as shown in (step 1). The invoice can be, for example, a PIF and include multiple transactions. The invoice includes a supplier identifier and an amount for each transaction. The supplier identifier can include information used to address the payment for the supplier (e.g., indicates payment information for the supplier). The supplier identifier can include, for example, an account number of the supplier, sort code of the supplier, or a payment address of the supplier.

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In some cases, the invoice may be provided by the supplier **302** through email or as a physical paper. In some cases, the invoice may be provided by the supplier **302** through an online payment system. In this case, the invoice may be digitally uploaded or manually entered by the supplier **302**. The payment system may be run by the supplier **302** or the buyer **304**.

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The buyer **304** can communicate a request to make a payment to the supplier **302** to the enhanced payment processing service **306**, as shown in (step **2**). The request can include payment information, such as one or more transactions. Each transaction can include at least the supplier identifier and the amount of the payment.

5 In some cases, the request may include the invoice provided by the supplier **302**. The buyer **304** can communicate the request through any suitable payment interface, such as through a payment portal. For example, the buyer **304** may upload the invoice to the enhanced payment processing service **306** through a payment portal. The payment portal may be accessed through a separate enhanced
10 payment processing application or through an existing bank application.

 In some cases, step **1** and step **2** may be a single step (e.g., the invoice is transferred directly to the enhanced payment processing service **306**). For example, in cases where the invoice is provided through a payment system, the payment system can directly communicate, upon request of the buyer **304**, to the enhanced payment
15 processing service **306**.

 The enhanced payment processing service **306** can obtain VCN information for each transaction received with the request for the enhanced payment processing transfer described in step **2**. Each obtained VCN information is unique and associated with one transaction. The VCN information can include a unique virtual
20 card number, an expiration date, a card security code, and a set amount of payment. The VCN information is linked to the enhanced payment processing account of the buyer **304**.

 The enhanced payment processing service **306** can obtain VCN information for each transaction in a variety of ways. In some cases, the enhanced
25 payment processing service **306** can generate the VCN information. In some cases, the enhanced payment processing service **306** can communicate with a separate service to request the VCN information; and receive the VCN information from the separate service.

 Advantageously, the use of a VCN protects both the consumer and the
30 bank. VCNs can protect the consumer against fraudulent charges by limiting the exposure of the active card details. VCNs can protect banks against chargebacks.

 The enhanced payment processing service **306** can communicate, for each transaction, the VCN information and a request for an enhanced payment processing transfer to the enhanced payment processing bank **308**, as shown in step **3**.

The request for the enhanced payment processing transfer can be a request for an electronic payment transfer from the enhanced payment processing bank **308** to a financial institution associated with the supplier identifier (e.g., the supplier bank **310**), such as an ACH payment or an FPS payment.

5 The request for the enhanced payment processing transfer can include the supplier identifier and the amount of the payment. In some cases, the request can include any additional information required to make an electronic payment to the supplier **302**.

10 The VCN information and the request for the enhanced payment processing transfer may be communicated in the same or separate requests. In addition, the enhanced payment processing service **306** can, in some cases, send multiple transactions (and corresponding VCNs) in one communication to the enhanced payment processing bank **308**.

15 The enhanced payment processing bank **308** can identify whether there is available credit for the buyer **304** using the VCN received from the enhanced payment processing service **306**. Enhanced payment processing bank **308** can identify whether there is available credit for the buyer **304** using a conventional payment card process, such as that described with respect to Figure 2, but where the enhanced payment processing bank **308** functions as both the merchant and the issuer.

20 In the described payment process using enhanced payment processing, the merchant system **320** can obtain the VCN information communicated to the enhanced payment processing bank **308**. The merchant system **320** can communicate with the acquirer **332**, the payment network **334**, and the issuer system **330** to perform a payment card process, such as described with respect to Figure 2.

25 For example, the VCN information can be provided to the acquirer **332**, as shown in (step 4). The acquirer **332** can, in turn, provide the VCN information to the payment network **334** associated with the form of payment, as shown in (step 5).

30 The payment network **334** can identify an issuing bank, or issuer, of the customer's form of payment. In this case, the issuer is the enhanced payment processing bank **308**, which processes the payment at the issuer system **330** of the enhanced payment processing bank **308**.

The transaction can be logged to aid in later processes, such as clearing and settlement. When the payment network **334** identifies the issuer system

330, the payment network **334** can send the VCN information and request authorization and/or preauthorization on the payment method, as shown in (step **6**).

The issuer system **330** can run the requested authorization or preauthorization. After one or more of the checks described with respect to Figure 2
 5 are performed, the issuer system **330** can accept the transaction and forward a signal of success or failure back to the payment network **334**, as shown in (step **7**).

Once the signal is received, the payment network **334** can forward the signal to the acquirer **332** as shown in (step **8**). The acquirer **332** can then forward the signal back to the merchant system **320**, as shown in (step **9**) to confirm that the
 10 transaction has been accepted. In some cases, the acquirer **332** is part of the merchant system **320**.

It should be understood that settlement and clearing can occur at a later time.

Once the enhanced payment processing bank **308** identifies that there
 15 is available credit, the enhanced payment processing bank **308** can affect electronic payment to the bank account of the supplier **302** using the supplier identifier and the amount of the payment received from the enhanced payment processing service **306**, as shown in (step **10**).

In the described payment process using the enhanced payment
 20 processing process, the payment transfer system **322** can obtain the enhanced payment processing transfer request communicated to the enhanced payment processing bank **308**. The payment transfer system **322** can obtain the supplier identifier and the amount of the payment. Step **10** may be performed using any suitable electronic payment process, such as step 2 in the conventional electronic payment process
 25 described with respect to Figure 1.

The merchant system **320** can communicate the processing result of the VCN information to the payment transfer system **322**. If the merchant system **320** indicates that there is available credit, the payment transfer system **322** can affect electronic payment to the bank account of the supplier **302** using the supplier
 30 identifier and the amount of payment.

That is, the payment transfer system of the enhanced payment processing bank **308** can credit the supplier bank **310** with the electronic payment funds. As previously described, the electronic payment can be any electronic bank to bank payment such as an ACH payment or an FPS payment.

Upon receiving the electronic payment funds described in step **10**, the supplier bank **310** can credit the account of the supplier **302** with the amount of the payment. The supplier **302** can then have immediate/near immediate access to the deposited funds.

5 Figure 4 shows an example process flow diagram for providing enhanced payment processing according to an embodiment of the invention. Referring to Figure 4, an enhanced payment processing service performing process **400** can be implemented by a server embodied as described with respect to computing system **500** shown in Figure 5.

10 In some cases, the enhanced payment processing service may be part of an enhanced payment processing bank. In some cases, the enhanced payment processing service may be a separate system in communication with an enhanced payment processing bank.

 The communications between these systems may be, for example, via
15 application programming interfaces (APIs). An API is an interface implemented by a program code component or hardware component (hereinafter “API-implementing component”) that allows a different program code component or hardware component (hereinafter “API-calling component”) to access and use one or more functions, methods, procedures, data structures, classes, and/or other services provided by the
20 API-implementing component. An API can define one or more parameters that are passed between the API-calling component and the API-implementing component. The API is generally a set of programming instructions and standards for enabling two or more applications to communicate with each other and is commonly
25 implemented over the Internet as a set of Hypertext Transfer Protocol (HTTP) request messages and a specified format or structure for response messages according to a REST (Representational state transfer) or SOAP (Simple Object Access Protocol) architecture.

 Referring to process **400**, the enhanced payment processing service can receive a request from a first party to make a payment to a second party (**402**). The
30 first party may be a buyer and the second party may be a supplier. The request may include one or more transactions; and each transaction can include at least a second party identifier and an amount of the payment. In some cases, the request may be received from an online payment system and can include a PIF indicating the one or more transactions.

In response to receiving the request (402), the enhanced payment processing service can obtain virtual card number information for each transaction (404). The virtual card information can include, but is not limited to, a virtual card number and expiration date, a card security code, and an amount of the payment.

5 The enhanced payment processing service can obtain the virtual card number information in a variety of ways. In some cases, the enhanced payment processing service can generate the virtual card number information for one or more of the transactions. In some cases, the enhanced payment processing service can communicate with a separate service to request the virtual card number information
10 and can receive the virtual card number information from the separate service.

 For each transaction, the enhanced payment processing service can communicate the virtual card number information and a request for an enhanced payment processing transfer to an enhanced payment processing bank (406). The request for the enhanced payment processing transfer can include the second party
15 identifier and the amount of the payment.

 The request for the enhanced payment processing transfer can be a request for an electronic payment transfer from the enhanced payment processing bank to a financial institution associated with the second party identifier according to a processing result of the virtual card number information. For example, if the
20 processing result of the virtual card number information indicates there is available credit associated with the virtual card number, an electronic payment transfer to the financial institution associated with the second party identifier can be affected.

 In some cases, the enhanced payment processing service may communicate the virtual card number information to a merchant system within the
25 enhanced payment processing bank. The merchant system may process the virtual card information according to any suitable card payment process.

 In some cases, the enhanced payment processing service may communicate to the request for the enhanced payment processing transfer to a payment transfer system within the enhanced payment processing bank. The payment
30 transfer system may affect electronic payment to a bank account of the second party using the second party identifier and the amount of the payment.

Exception Process Scenarios

 There are a number of places where an error may occur that can cause a transaction to not result in a bank transfer. The issue may occur as part of the credit

card transaction (*e.g.*, “authorized not cleared” error, “cleared not settled” error, “issue authorization decline” error, “authorization response” error), part of the bank transfer (*e.g.*, ACH failure), or issues with the system itself (*e.g.*, “system-bank transfer” error, failure to obtain VCN).

5 Authorized Not Cleared Error

In some cases, upload and acceptance of a payment file may not result in a bank transfer. One such case is when the transaction is an “authorized not cleared” error. As previously discussed in Figure 2, there are three stages in a standard credit card transaction: Authorization, Clearing, and Settlement. Sometimes, a transaction may encounter an issue or error. If the card successfully completes authorization, there may be a delay in clearing, perhaps due to insufficient funds on the part of the issuer, that prevents the credit card transaction from completing and, thus, the bank transfer will not occur. In the case of an “authorized not cleared” error, the user may be notified of the delay.

15 Cleared Not Settled Error

Another such case of a payment file not resulting in a bank transfer is a “cleared not settled” error. Similar to an “authorized not cleared” error, a “cleared not settled” error can occur in between stages during a credit card transaction. Specifically, a “cleared not settled” error is when a transaction is both authorized and then later cleared, but settlement has not occurred for some reason. While clearing should always result in a settlement, the acquirer may not want to move funds until the transaction has been received in order to minimize financial risk. In the case of a “cleared not settled” error, the user may be notified of the delay.

25 Issuer Authorization Decline Error

In some cases, the credit card transaction may fail without an error on the part of the entities in the credit card payment process. For instance, a user may not have enough credit in an account to make a purchase. As an example, a user may try to make 10 transactions for \$100 with only \$500 in available credit. In this instance, the first five transactions may be approved, but the last five may be declined by the issuer for lack of available credit, since the first five transactions would put the user at their credit limit. In the case of an “issuer authorization decline” error, the user may be prompted to resubmit a request and payment, either at the time of the notification or at a later date.

Authorization Response Error

In some cases, there may be an issue preventing authorization of a transaction, resulting in an “authorization response” error. For example, an “authorization response” error may occur if no response is received from an issuer in the process of authorization or pre-authorization. In the event of an “authorization response” error, the transaction can be automatically cancelled. If the transaction is automatically cancelled, the user may be prompted to resubmit the request. In another implementation, the payment network may have discretion based on their history with a client to enable the transaction to move forward without explicit instruction from the issuer in the case of no communication.

ACH Failure Error

An “ACH failure” error may occur if the credit card transaction has successfully been completed, but there is an issue with the bank transfer. For instance, a banking platform may be temporarily down, or the destination account may not accept bank transfers of the requested variety. In the case of an “ACH failure” error, the user may be notified of the delay.

Failure to Obtain VCN Error

In some cases, the system may experience technical error at one or more points in the enhanced payment processing process that may result in a failed transaction. One example of such an error is a “failure to obtain a VCN” error. For example, if the source of the generated VCNs is nonfunctional, a VCN may not be created and the process may not be able to continue. Alternatively, a user may not have an account with a bank that serves as an issuer for the VCNs or may have a hold on their account that would prevent a VCN from being generated. In the case of a “failure to obtain VCN” error, the system may try again automatically one or more times, or the user may be prompted to resubmit.

System-Bank Transfer Error

Another error of the system that may result in a failed transaction is an issue in pushing the VCNs to the bank acting as a merchant. An example of a method of pushing the VCNs to the merchant may be MasterCard payment gateway services straight through processing. In the case of a failure to push the VCN to the merchant, one or more retries may be automatically attempted. If the error persists, the user may be prompted to resubmit.

Figure 5 illustrates components of a computing system that may be used in certain embodiments described herein. Referring to Figure 5, system **500** may be implemented within a single computing device or distributed across multiple computing devices or sub-systems that cooperate in executing program instructions.

- 5 The system **500** can include one or more blade server devices, standalone server devices, personal computers, routers, hubs, switches, bridges, firewall devices, intrusion detection devices, mainframe computers, network-attached storage devices, and other types of computing devices. The system hardware can be configured according to any suitable computer architectures such as a Symmetric Multi-
 10 Processing (SMP) architecture or a Non-Uniform Memory Access (NUMA) architecture.

- The system **500** can include a processing system **510**, which may include one or more processors and/or other circuitry that retrieves and executes software **520** from storage system **530**. Processing system **510** may be implemented
 15 within a single processing device but may also be distributed across multiple processing devices or sub-systems that cooperate in executing program instructions.

- Storage system(s) **530** can include any computer readable storage media readable by processing system **510** and capable of storing software **520**. Storage system **530** may be implemented as a single storage device but may also be
 20 implemented across multiple storage devices or sub-systems co-located or distributed relative to each other. Storage system **530** may include additional elements, such as a controller, capable of communicating with processing system **510**. Storage system **530** may also include storage devices and/or sub-systems on which data is stored. System **500** may access one or more storage resources in order to access information
 25 to carry out any of the processes indicated by software **520**.

- Software **520**, including routines for performing processes such as process **400** for the enhanced payment processing service may be implemented in program instructions and among other functions may, when executed by system **500** in general or processing system **510** in particular, direct the system **500** or processing
 30 system **510** to operate as described herein.

In embodiments where the system **500** includes multiple computing devices, the server can include one or more communications networks that facilitate communication among the computing devices. For example, the one or more communications networks can include a local or wide area network that facilitates

communication among the computing devices. One or more direct communication links can be included between the computing devices. In addition, in some cases, the computing devices can be installed at geographically distributed locations. In other cases, the multiple computing devices can be installed at a single geographic location, such as a server farm or an office.

A communication interface **540** may be included, providing communication connections and devices that allow for communication between system **500** and other computing systems (not shown) over a communication network or collection of networks (not shown) or the air.

In some embodiments, system **500** may host one or more virtual machines.

Alternatively, or in addition, the functionality, methods and processes described herein can be implemented, at least in part, by one or more hardware modules (or logic components). For example, the hardware modules can include, but are not limited to, application-specific integrated circuit (ASIC) chips, field programmable gate arrays (FPGAs), system-on-a-chip (SoC) systems, complex programmable logic devices (CPLDs) and other programmable logic devices now known or later developed. When the hardware modules are activated, the hardware modules perform the functionality, methods and processes included within the hardware modules.

It should be understood that as used herein, in no case do the terms “storage media,” “computer-readable storage media” or “computer-readable storage medium” consist of transitory carrier waves or propagating signals. Instead, “storage” media refers to non-transitory media.

Although the subject matter has been described in language specific to structural features and/or acts, it is to be understood that the subject matter defined in the appended claims is not necessarily limited to the specific features or acts described above. Rather, the specific features and acts described above are disclosed as examples of implementing the claims and other equivalent features and acts are intended to be within the scope of the claims.

What is claimed is:

1. A computing device of an enhanced payment processing service comprising:
 - a processor;
 - 5 a storage device; and
 - instructions stored in the storage device that when executed by the processor, direct the computing device to:
 - receive, by the computing device of the enhanced payment processing entity, a request from a buyer to make a credit card payment for a bank to bank funds transfer to
 - 10 a supplier that does not accept credit card payments, the request comprising one or more transactions, each transaction comprising at least a supplier identifier of the supplier and an amount of payment for that transaction;
 - in response to receiving the request, generate, by the computing device of the enhanced payment processing entity, virtual card number information for each
 - 15 transaction; and
 - for each transaction:
 - provide the virtual card number information, the amount of payment for that transaction, and the supplier identifier to an acquirer;
 - receive, from a payment network, an authorization/preauthorization
 - 20 request comprising the virtual card information and the amount of payment for that transaction;
 - process the authorization/preauthorization request to determine an authorization/preauthorization result;
 - provide the authorization/preauthorization result to the payment
 - 25 network;
 - receive, from the acquirer, confirmation of the authorization/preauthorization result; and
 - send, to a financial institution associated with the supplier identifier, an electronic payment transfer in the amount of payment for that transaction.
- 30 2. The computing device of claim 1, wherein the electronic payment transfer is an automated clearing house transfer.

3. The computing device of claim 1, wherein the electronic payment transfer is a faster payments service transfer.

4. The computing device of claim 1, wherein the virtual card number information comprises a virtual card number, an expiration date, a card security code, and the amount of the payment.

5. The computing device of claim 1, further comprising:
in response to communicating the virtual card number information and the payment processing request, receiving an indication of one or more failed authorizations for the one or more transactions.

6. The computing device of claim 1, wherein the supplier identifier comprises one of more of an account number of the supplier, a sort code of the supplier, and a payment address of the supplier.

7. One or more computer-readable storage media having instructions for an enhanced payment processing service stored thereon that when executed, direct a processing system to:

receive, by an enhanced payment processing entity, a request from a buyer to make a credit card payment for a bank to bank funds transfer to a supplier that does not accept credit card payments, the request comprising one or more transactions, each transaction comprising at least a supplier identifier of the supplier and an amount of payment for that transaction;

in response to receiving the request, generate, by the enhanced payment processing entity, virtual card number information for each transaction; and

for each transaction:

provide the virtual card number information, the amount of payment for that transaction, and the supplier identifier to an acquirer;

receive, from a payment network, an authorization/preauthorization request comprising the virtual card information and the amount of payment for that transaction;

process the authorization/preauthorization request to determine an authorization/preauthorization result;

provide the authorization/preauthorization result to the payment network;

receive, from the acquirer, confirmation of the authorization/preauthorization result; and

5 send, to a financial institution associated with the supplier identifier, an electronic payment transfer in the amount of payment for that transaction.

8. The media of claim 7, wherein the electronic payment transfer is an automated clearing house transfer.
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9. The media of claim 7, wherein the electronic payment transfer is a faster payments service transfer.

10. The media of claim 7, wherein the virtual card number information
15 comprises a virtual card number, an expiration date, a card security code, and the amount of the payment.

11. A method comprising:

receiving, by a computing system of an enhanced payment processing entity, a
20 request from a buyer to make a credit card payment for a bank to bank funds transfer to a supplier that does not accept credit card payments, the request comprising one or more transactions, each transaction comprising at least a supplier identifier of the supplier and an amount of payment for that transaction;

in response to receiving the request, generating, by the computing system of the
25 enhanced payment processing entity, virtual card number information for each transaction; and

for each transaction:

providing the virtual card number information, the amount of payment for that transaction, and the supplier identifier to an acquirer;

30 receiving, from a payment network, an authorization/preauthorization request comprising the virtual card information and the amount of payment for that transaction;

processing the authorization/preauthorization request to determine an authorization/preauthorization result;

providing the authorization/preauthorization result to the payment network;

receiving, from the acquirer, confirmation of the authorization/preauthorization result; and

5 sending, to a financial institution associated with the supplier identifier, an electronic payment transfer in the amount of payment for that transaction.

12. The method of claim 11, wherein the electronic payment transfer is an automated clearing house transfer.

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13. The method of claim 11, wherein the electronic payment transfer is a faster payments service transfer.

14. The method of claim 11, wherein the virtual card number information

15 comprises a virtual card number, an expiration date, a card security code, and the amount of the payment.