

METHODS FOR TARGET LOGO RECOGNITION AND BRIDGING TRANSACTIONS

BACKGROUND OF THE INVENTION

Related Application

This application claims the benefit of the US Provisional Application No. 63/520,928 filed on August 21, 2023, titled “METHODS FOR QR CODE LOGO RECOGNITION AND BRIDGING TRANSACTION,” which is incorporated herein by reference at its entirety.

Field of the Invention

The present invention relates to a target bridging technology with logo pattern recognition, which enables a transaction between a payer of a first service provider and a receiver of a second service provider.

Description of Related Art

Mobile payments are extensively used for payment transactions across the world. Among different mobile payment methods, scan-to-pay systems using targets such as 1D barcode or 2D QR codes are very common in mobile payment services. A scan-to-pay mobile payment service provider (MPSP) is a closed-loop payment network which can provide mobile payment services. Each mobile payment service provider uses its own target format in its payment system, and different payment service providers usually do not recognize each other's target unless there is a bilateral agreement.

If cross-service provider transactions are desired, it will require a common payment interface such as common targets, integrated systems, and APIs. There are different approaches implemented to deal with this problem. The first approach

is signing bilateral agreement between two service providers and modifying each party's system to accommodate the agreement. The second approach is using a common standard such as national QR standard to display a conformed payment targets (in merchant-presented mode) for users of participating service providers to scan and pay. The third approach is introducing an intermediate institution as a "bridging service provider" between different service providers. Among the above approaches, the third one is the most convenient, since the participating service providers are not forced to adopt a new target format, and every participating service provider only needs to modify its system to incorporate new functions provided by the bridging service provider.

In a bridging service provider-mediated cross-service provider transaction, it is important for a service provider to identify another service provider in this transaction. Sometimes this can be done by analyzing the format or content of the transaction target. However, it is possible that two service providers use the same or similar data format, and thus it is possible for different payment systems to have the same target values. Due to that, it is hard to avoid collisions among payment systems with the same values, and so it is hard to identify which service provider a transaction target belongs to only by its target values.

Therefore, methods to facilitate service provider identification in cross-service provider transactions are still desired.

SUMMARY OF THE INVENTION

For most mobile payment service providers, their transaction targets (e.g., QR codes) has embedded logos or names of service providers inside. Thus, recognizing the logos may be an efficient way to identify the service provider that a target belongs to. Provided herein are methods for target bridging with logo pattern recognition, which enable a transaction between a payer of a first service

provider and a receiver of a second service provider. Once the logo is recognized, the payment processes can be streamlined or incorporated automatically in either MPM or CPM flow since the acquirer is identified. The improvement of this invention on the mobile payment processes is enabling bridged transactions with less involvement of user training and learning.

The present application provides methods for bridging a transaction between a payer of a first service provider and a receiver of a second service provider. The bridged transaction may be a merchant presented mode (MPM) transaction, or a consumer presented mode (CPM) transaction. Based on the actual needs, the logo pattern recognition process may be performed by a portable device of the payer, an issuer system of the first service provider, a bridging system of the bridging service provider, an acquirer system of the second service provider, or a merchant device of the receiver, as long as the counterparty service provider can be accurately identified.

From the perspective of a portable device of the payer, a method for bridging an MPM transaction comprises the steps of: (1) scanning a logo embedded target of the second service provider and its nearby regions to obtain a scanned image to be processed; (2) performing logo pattern recognition on the scanned image against a library of service providers to identify an acquirer identity of the second service provider; (3) decoding the logo embedded target into a target content of the second service provider; and (4) wirelessly providing the acquirer identity and the target content to an issuer system of the first service provider. In this method, the first service provider is different from the second service provider, and the library of service providers comprises a repository of logos, names, trademarks, and other unique identifiers associated with service providers.

From the perspective of a portable device of the payer, a method for bridging an CPM transaction comprises the steps of: (1) receiving a scanned image

containing one or more logos of service providers; (2) performing logo pattern recognition on the scanned image against a library of service provider to identify an acquirer identity of the second service provider; and (3) providing a bridging target of the second service provider based on the acquirer identity the, to a merchant device of the receiver which recognizes the bridging target. In this method, the first service provider is different from the second service provider, and the method is performed without selecting a service provider by the payer.

From the perspective of an issuer system of the first service provider, a method for bridging an MPM transaction comprises the steps of: (1) wirelessly receiving (a) a scanned image of a logo embedded target of the second service provider or (b) a target content of the logo embedded target and an acquirer identity of the second service provider, from a portable device of the payer; (2) if the issuer system wirelessly receives the scanned image of the logo embedded target from the portable device, performing logo pattern recognition on the scanned image against a library of service providers to identify the acquirer identity of the second service provider; (3) providing the target content and the acquirer identity to a bridging system of a bridging service provider; and (4) receiving a payment request generated based on the target content of the logo embedded target, from the bridging system. In this method, the acquirer identity of the second service provider is identified by logo pattern recognition on the scanned image of the logo embedded target.

From the perspective of an issuer system of the first service provider, a method for bridging an CPM transaction comprises the steps of: (1) wirelessly receiving a target request comprising an acquirer identity of the second service provider, from a portable device of the payer for a target content of the second service provider; (2) providing the target request to the bridging system; (3) receiving the target content of the second service provider from the bridging

system; and (4) providing the target content to the portable device of the payer. In this method, the acquirer identity is selected from a matching acquirer list generated based on logo pattern recognition on a scanned image against a library of service providers, and the scanned image comprises one or more logos of service providers.

From the perspective of a bridging system of the bridging service provider, a method for bridging an MPM transaction comprises the steps of: (1) receiving (a) a scanned image of a logo embedded target of the second service provider or (b) a target content of the logo embedded target and an acquirer identity of the second service provider, from an issuer system of the first service provider; (2) if the bridging system wirelessly receives the scanned image of the logo embedded target from the issuer system, performing logo pattern recognition on the scanned image against a library of service providers to identify the acquirer identity of the second service provider; (3) providing the target content to an acquirer system of the second service provider based on the acquirer identity; (4) receiving a payment request generated based on the target content from the acquirer system; and (5) providing the payment request to the issuer system.

From the perspective of a bridging system of the bridging service provider, a method for bridging an CPM transaction comprises the steps of: (1) receiving a target request comprising an acquirer identity of the second service provider from an issuer system of the first service provider; and (2) providing a target content of the second service provider to the issuer system. In this method, the acquirer identity is selected from a matching acquirer list generated based on logo pattern recognition on a scanned image against a library of service providers, and the scanned image comprises one or more logos of service providers.

From the perspective of a bridging system of the bridging service provider, another method for bridging an CPM transaction comprises the steps of: (1)

receiving (a) a scanned image of a logo embedded target of the first service provider or (b) a target content of the logo embedded target and an issuer identity of the first service provider, from an acquirer system of the second service provider; (2) if the bridging system receives the scanned image of the logo embedded target from the acquirer system, performing logo pattern recognition on the scanned image against a library of service providers to identify the issuer identity of the first service provider; (3) providing the target content and a payment request to an issuer system of the first service provider based on the issuer identity; and (4) receiving a payment approval from the issuer system. In this method, the issuer identity of the first service provider is identified by logo pattern recognition on the scanned image against a library of service providers, and the payment request is generated based on transaction information provided by the receiver.

From the perspective of an acquirer system of the second service provider, another method for bridging an CPM transaction comprises the steps of: (1) receiving (a) a scanned image of a logo embedded target of the first service provider or (b) a target content of the logo embedded target and an issuer identity of the first service provider, from a merchant device of the receiver; (2) if the acquirer system receives the scanned image of the logo embedded target from the merchant device, performing logo pattern recognition on the scanned image against a library of service providers to identify the issuer identity of the first service provider; and (3) providing the target content, the issuer identity and a payment request to a bridging system of a bridging service provider. In this method, the issuer identity of the first service provider is identified by logo pattern recognition on the scanned image against a library of service providers, and the payment request is generated based on transaction information provided by the receiver.

Other objectives, advantages and novel features of the invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows a system for target bridging service.

FIG. 2 shows a bridging network with multiple participating service providers. All participating service providers communicate with each other via the bridging service provider. In this figure, a user of the 1st service provider acts as payer, and a user of the 2nd service provider acts as receiver.

FIG. 3 shows the flow chart of a bridged MPM transaction with logo pattern recognition for a payer to identify the second service provider (acquirer) in this bridged transaction.

FIG. 4 shows the flow chart of a bridged CPM transaction with logo pattern recognition for a payer to identify available second service providers (acquirers) to proceed with a bridged transaction.

FIG. 5 shows the flow chart of a bridged CPM transaction with logo pattern recognition for a receiver to identify the first service provider (issuer) in this bridged transaction.

FIG. 6A shows an example of logo embedded QR code, which is a kind of logo embedded target. In this example, the logo of a service provider, HIVEX, is placed in the center of the QR code. FIG. 6B shows another example of logo embedded QR code. In this example, the logo is placed at a position other than the center inside the QR code. A logo may be placed at any position inside a QR code as long as it is compliant to the QR standards and provides scan readability and accuracy.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

The terminology used in the description presented below is intended to be interpreted in its broadest reasonable manner, even though it is used in conjunction with a detailed description of certain specific embodiments of the technology. Certain terms may even be emphasized below; however, any terminology intended to be interpreted in any restricted manner will be specifically defined as such in this Detailed Description section.

As used in the specification and claims, the term “service provider” refers to a party providing digital property transfer service via sending and/or receiving target information or a target. In one embodiment of this disclosure, a service provider is an electronic payment or transfer system provider which enables electronic payments or transfers of digital property between two parties. The two parties may be a payer and a receiver, and the service provider may utilize a target to exchange information, such as a payer identifier, a receiver identifier, a time stamp and a request for transaction. A service provider usually contains management system(s) to execute its functionalities related to digital property transactions. In a cross-service provider transaction, one of the service provider is an issuer and another one is an acquirer. An issuer is a financial institution that supplies a consumer with a payment tool they use to initiate a transaction. On the other hand, an acquirer is a financial institution that provide a merchant with the tools needed to collect payment from issuers. In this framework, the consumer is usually a payer, and the merchant is usually a receiver. Depending on its role in different transactions, a service provider may sometimes act as an issuer and sometimes act as an acquirer. In this specification, the mobile payment service provider on the payer side of a cross-service provider transaction is called issuer, and its management system is called issuer system. Likely, the mobile payment service provider on the receiver side is called acquirer, and its management system is called acquirer system.

The term “payer” used herein refers to a party, an individual or an entity, who authorizes a transaction to transfer his/her digital properties to others. A payer of a service provider is also a user of the service provider who holds an account of the service provider. A user is able to transfer digital properties stored in the account to others and receive digital properties from others. In one embodiment, the account is implemented by a virtual wallet. To initiate a payment, the payer may present a target via his/her portable device to a receiver, or may scan a target from a receiver via the portable device.

The term “receiver” refers to a party, an individual or an entity, who receives digital properties transferred from others. A receiver of a service provider may be either a user or a merchant of the service provider. A merchant of a service provider is able to recognize a target of the service provider. However, a merchant of a service provider who may not hold an account of the service provider and, thus, may not be a user of the service provider. In other words, the merchant of the service provider may carry out the merchant function through a merchant acquirer, and do not have direct relationship with the service provider. The receiver may scan a target presented by the payer, or present a target for the payer’s scanning to initiate a request for a payment.

The term “digital property” used herein refers to anything that exists in digital form and has economic value, including but not limited to multiple types of digital assets, credits, and obligations, such as digital currencies, digital securities, digital bonds, digital futures, digital precious metals, non-fungible tokens (NFTs), digital coupons, and digital fee tokens. Digital currencies may include but not limited to digital US Dollars, digital Japanese Yens, digital Euros, and digital New Taiwan Dollars. Digital securities may include but not limited to digital Apple stocks, digital Google stocks, and digital mutual funds. Digital precious metals may include but not limited to digital gold, digital platinum, and digital silver.

Digital futures may include but not limited to digital futures of coffee beans, soy beans, and corns. An NFT may be an electronic record owned/controlled by a party in which it has a right or interest, which includes but not limited to photography, logos, illustrations, animations, audiovisual media, presentations, spreadsheets, digital paintings, word documents, electronic mails, websites, and a multitude of other digital formats and their respective metadata. A transaction can be initiated by a transaction request. There are two types of transaction requests, one is a request to send out digital property to the other party, and the other one is a request to ask the other party to pay digital property. The former case is referred to as “delivery request” and the latter case is referred to as “payment request” in this application.

The term “target” used herein refers to a medium containing information in a format which can be recognized or sensed by specific devices. Examples include but not limited to barcode, QR code, NFC (Near-field Communication) tag, voice signature, and fingerprint. The target information may be resolved by extracting features embedded in the target, for example, by scanning QR code, sensing NFC tag, extracting voice signature from voice, or scanning fingerprint to extract the features and obtain the target information contained therein. In an embodiment of the present invention, the target is a 1D barcode. In another embodiment, the target is a QR code.

The term “target content” used herein refers to the information contained in the target, which includes but not limited to locators, identifiers, and trackers. The target content may be in a format of a string. In one embodiment of the present invention, a target content contains a payer identifier and/or a receiver identifier, and a request for transaction, which provides the information of a payer and/or a receiver. In one embodiment, a target content further comprises a transaction amount and the currency of a transaction. A target may be generated based on the

target content. Since a target content is often encrypted, a service provider usually can only resolve target content of its own but not target content of other service providers.

The term “portable device” used herein refers to a device with basic computing resources (in the form of a processor, memory, and storage) and wireless communication, such as telecommunication network, WiFi, Bluetooth, satellite, radio broadcast, microwave, infrared, etc. Examples include but not limited to laptops, tablets and smartphones.

The term “bridge” or “bridging” used herein refers to the system or the method that enables a payer of a first service provider to present a target of a second service provider to a receiver of the second service provider, who does not recognize a target of the first service provider, so that a transaction between the payer and the receiver can be completed. Since the first service provider and the second service provider use different target formats or rules, the receiver of the second service provider does not recognize a target of the first service provider. In one embodiment of consumer presented mode (CPM), the bridging service enables payer’s portable device to present a target recognizable to the merchant device (e.g. POS) which cannot recognize a target of the issuer. In another embodiment of consumer presented mode (CPM), the bridging service enables the receiver’s merchant device to recognize a target of issuer provided by the payer. In one embodiment of merchant presented mode (MPM), the bridging service enables payer’s portable device to recognize a target of acquirer provided by the merchant.

The term “bridging service provider” refers to a service provider that provides bridging technology to other service providers. A bridging service provider may be the first service provider, the second service provider, or a separate bridging service provider which is neither the first service provider nor the

second service provider. And the term “bridging system” refers to the system(s) of the bridging service provider to execute functionalities of bridging service.

The term “pattern recognition” refers to pattern recognition data analysis methods that use machine learning algorithms to recognize patterns and regularities in data. In one embodiment of the present invention, the data to be analyzed is image data of a scanned image, and the dataset for a machine learning algorithm to learn is a library of service providers, which comprises a repository of logos, names, trademarks, and other unique identifiers associated with service providers. The library of service providers may be stored in the bridging system, the management system of service providers, or the portable device/merchant device. Any device or system which stores a copy of the pattern library can perform pattern recognition. For example, a payer device may scan a logo embedded target as the scanned image and perform pattern recognition to find a match in the library. In one embodiment of the present invention, a bridging system of the bridging service provider runs a host system to maintain the library of logos and patterns of the participating service providers. This host system is used for pattern matching to identify the acquirer and/or the issuer.

The embodiments introduced below can be implemented by programmable circuitry programmed or configured by software and/or firmware, or entirely by special-purpose circuitry, or in a combination of such forms. Such special-purpose circuitry (if any) can be in the form of, for example, one or more application-specific integrated circuits (ASICs), programmable logic devices (PLDs), field-programmable gate arrays (FPGAs), graphics processing units (GPUs), etc.

This application relates to methods for target bridging with logo pattern recognition. With pattern recognition, it will be easier for a first service provider to identify a second service provider which it is going to have a transaction with. The first service provider or a bridging service provider can correctly route the

transaction target to the second service provider without recognizing any information in the transaction target.

A target, such as QR code, in the mobile payment industries, plays a similar role to a credit card number in the conventional payment industries. The holder of a credit card can only use the card for payment in a merchant store which recognizes the credit card number. Similarly, a payer of a first service provider can only use a target (e.g. QR code) of the first service provider at a receiver which recognizes the target (usually a merchant store of the first service provider). A receiver of the first service provider cannot recognize a target of the second service provider with its device (e.g. POS). Similarly, a receiver of the second service provider cannot recognize a target of the first service provider with its device. To enable a transaction between a payer of an issuer and a receiver of an acquirer by target scanning or sensing, a bridging service provider is introduced and acts as a bridge to facilitate communications between the issuer and the acquirer. Also, a bridging service provider may provide a payer of the first service provider with a bridging target or target content of a second service provider. As such, the payer may present a target which is recognizable to a merchant device of the second service provider. The bridging target is provided by bridging system of the bridging service provider, instead of being generated by issuer system of the first service provider or portable device of the payer. In one embodiment, the target content of a bridging target is generated by acquirer system of the second service provider and is then provided to portable device of the payer via the bridging system.

Referring to FIG. 1, a system for target bridging service 100 comprises a first device 115 of a first party 110, a first management system 125 of a first service provider 120, a second device 155 of a second party 150, a second management system 145 of a second service provider 140, and a bridging system

135 of a bridging service provider 130. However, it should be noted that there are multiple management systems of multiple service providers connected to the bridging system 135 in the bridging payment network, as shown in FIG. 2. For clarity, only the two service providers involve in the bridged transaction are specified. Let's arbitrarily assume that the first party is a payer and the second party is a receiver, and so the first management system is an issuer system and the second management system is an acquirer system.

The payer 110 is a user of the first service provider 120 having a portable device 115, such as a smartphone, wirelessly connected to an issuer system 125 of the first service provider 120. The receiver 150 is a merchant or a user of the second service provider 140 having a merchant device 155 connected wirelessly or with wires to an acquirer system 145 of the second service provider 140. In the example shown in FIG. 1, the payer 110 transfers a digital property to the receiver 150. The bridging service provider 130 has a bridging system 135 communicatively connected to both the issuer system 125 and the acquirer system 145 and acts as the "bridge" between two different service providers. The bridging service provider 130 thus acts as a special user of the first service provider 120 to receive fund from the payer 110, and it also acts as a special user of the second service provider 140 to transfer fund to the receiver 150.

To provide bridging transaction related services, the bridging system 135 of the bridging service provider 130 may be configured to perform three functions—third party target content/bridging target provider, third party authorization proxy, and third party clearing house. First, the bridging system 135 of the bridging service provider 130 may provide a target content or bridging target (e.g. target content or bridging target of the second service provider 140 in one embodiment) to the issuer system 125. Second, the bridging system 135 of the bridging service provider 130 may function as a third party authorization proxy to relay the

transaction request and approval between the issuer system 125 and the acquirer system 145. To identify the two parties involved in the transaction, the bridging system 135 may further assign a bridging payer identifier to the payer, assign a bridging receiver identifier to the receiver, and link both identifier with a bridging transaction identifier. Third, the bridging system 135 of the bridging service provider 130 may function as a third party clearing house to bridge and clear the transactions between different service providers with a transaction bridge mechanism, for example clearing multiple transactions between the first service provider and the second service provider, based on the related transaction information recorded. In some embodiments, the bridging system 135 is also configured to perform logo pattern recognition on scanned images of logos or logo embedded targets. The bridging system 135 may be equipped with a pattern library comprising a repository of logos, names, trademarks, and other unique identifiers associated with service providers. A trained machine learning algorithm may utilize the pattern library to find matches in the incoming scanned images.

Among other functions of a service provider, the issuer system 125 of the first service provider 120 is configured to implement additional functions associated with a bridged transaction. In a merchant presented mode (MPM) transaction, the additional functions may include some or all of the following: (1) receiving a target content of an acquirer (i.e. the second service provider), (2) receiving or identifying an acquirer identity of the acquirer from an acquirer list, (3) receiving a scanned image of a target and providing the same to the bridging system 135 to identify an acquirer identity, (4) providing the target content to the bridging system 135 to resolve a payment information, (5) receiving a transaction request from the bridging system 135, (6) returning a transaction approval to the bridging system 135, and (7) handling notifications from the bridging system 135. To efficiently identify an acquirer identity of the second service provider, logo

pattern recognition is performed on an image of the scanned target to check whether there is a logo in the image matched with one stored in a library of service providers. In a consumer presented mode (CPM) transaction, the additional functions associated with a bridged transaction may include some or all of the following: (1) receiving a scanned image of a logo and providing the same to the bridging system 135 to identify an acquirer identity (2) selecting or identifying an acquirer (i.e. the second service provider) for a transaction, (3) requesting a target content or bridging target of the acquirer, (4) receiving the target content or bridging target, and provide the same to the payer 110, (5) receiving the transaction request from the bridging system 135, (6) returning a transaction approval to the bridging system 135, and (7) handling notifications from the bridging system 135. The bridging system 135 may provide a target content or bridging target of each of multiple service providers around the world, where these multiple service providers form a bridging network. In addition, to efficiently identify an acquirer identity of the second service provider, the payer may use his/her portable device to scan logos of available acquirers, and then logo pattern recognition may be performed to check whether there is a match between the scanned logo and the library of service providers. Also, to identify the payer involved in the bridged transaction, the issuer system may also provide a bridging payer identifier recognizable to the bridging system.

Among other functions of a service provider, the acquirer system 145 of the second service provider 140 is configured to implement additional functions associated with a bridged transaction. In CPM transaction, the acquirer system 145 is configured to recognize a bridging target scanned by the merchant device 155 of the receiver 150. Since the bridging target is generated based on the target format and rule of the second service provider, the merchant device 155 recognizes the bridging target, just like a target from another payer of the second service provider.

The acquirer system 145 may parse the target content to identify the bridging service provider 130. In addition, the acquirer system 145 may receive the related transaction information, such as the description of the products or services sold by the receiver 150, the amount, and the currency type. In MPM transaction, the acquirer system 145 is configured to receive a delivery request from the bridging system 135 after the payer 110 scans a receiver target of the receiver 150. The acquirer system 145 may parse the target content to identify a receiver identity 150 and/or the related transaction information, such as the description of the products or services sold by the receiver 150, the amount, and the currency type. Next, in both CPM and MPM transactions, the acquirer system 145 of the second service provider 140 may provide a payment request to the bridging system 135. The payment request may include a bridging transaction identifier, a receiver name and/or a bridging receiver identifier, and related transaction information. Lastly, upon receipt of a message confirming the bridged transaction, the acquirer system 145 may push out a message to notify the receiver 150 of the result, e.g. successful payment. In another embodiment of CPM transaction, the merchant device 155 or the acquirer system 145 can accept a target of the first service provider to proceed with a payment. This may be achieved by performing logo pattern recognition on a logo embedded target displayed by the payer. The acquirer system is configured to identify an issuer identity from the logo embedded target scanned by the merchant device, or is configured to receive an image of the logo embedded target from the merchant device and provide the same to the bridging system to identify an issuer identity. This is similar to what the issuer system does to identify an acquirer identity in MPM transactions. Then the acquirer system 145 provides a target content of the logo embedded target to the bridging system 135 for further processing. To accelerate transaction processing, the acquirer system 145 may directly provide a payment request including a receiver name, a bridging receiver

identifier, and related transaction information to the bridging system 135 along with the target content.

Merchant Presented Mode Transactions

In a bridged transaction of merchant presented mode (MPM), the receiver (e.g., the merchant) presents a receiver target of the second service provider. The payer (e.g., the consumer) scans the target, and transmits target content to an issuer system of the first service provider. The issuer system then relays the target content to a bridging system of the bridging service provider, and then to an acquirer system of the second service provider to request a transaction.

Without logo pattern recognition, the payer usually needs to select “the second service provider” from a list shown on the mobile App before scanning the target, or the issuer system/ bridging system needs to resolve the target content and identify that the target is of the second service provider. For example, PCT International Patent Publication No. WO2021/211773 describes details of resolving targets in bridged transactions. However, selecting a service provider from the list means an extra step (and sometimes human error occurs) when conducting transactions, and target resolving might not always be correct. Therefore, logo pattern recognition is applied in this invention to facilitate bridging of transactions.

In standard camera mode, the mobile app installed in the portable device resolves the receiver target in the scanned image and sends it directly for further data processing. Different from standard camera mode, in the scanning process, it is first to scan the whole scanned image without passing the target content to the mobile app. Instead, it performs a pattern matching against a library of service provider logos, names, and other unique diagrams, which is called a “pattern library”. Once it finds a match in the pattern library, a reference table is used to

identify the underlying acquirer (the service provider which the receiver target is affiliated to). And the target content is processed or passed along later on.

FIG. 3 shows the flow chart of a bridged MPM transaction with logo pattern recognition to identify the second service provider.

Step S301: The receiver 150 presents a logo embedded receiver target of the second service provider for the payer 110 to scan.

In Route (a) as described in steps S302a – S305a, the logo pattern recognition is performed by the portable device 115 of the payer 110.

Step S302a: The portable device 115 of the payer 110 scans the target and its nearby regions as a scanned image, and performs logo pattern recognition on the scanned image against a library of service providers (pattern library) to find a match in the library. By identifying which service provider the matched logo belongs to, an acquirer identity of the second service provider may then be identified.

Step S303a: The portable device 115 then resolves the receiver target to get a target content, and transmits the target content and the acquirer identity to an issuer system 125 of the first service provider 120.

Step S305a: The issuer system 125 relays the target content and the acquirer identity to a bridging system 135 of the bridging service provider 130. The issuer system 125 may also provide a bridging payer identifier of the payer 110 for the bridging service provider 130 to link the payer 110 with the bridged transaction at this step.

In Route (b) as described in steps S303b – S305b, the logo pattern recognition is performed by an issuer system 125 of the second service provider 120.

Step S303b: The portable device 115 of the payer 110 scans the target and its nearby regions as a scanned image. Then the portable device 115 transmits the scanned image to an issuer system 125 of the first service provider 120.

Step S304b: The issuer system 125 performs logo pattern recognition on the scanned image against a library of service providers (pattern library) to find a match in the library. By identifying which service provider the matched logo belongs to, an acquirer identity of the second service provider may then be identified.

Step S305b: The issuer system 125 relays the target content and the acquirer identity to a bridging system 135 of the bridging service provider 130. The issuer system 125 may also provide a bridging payer identifier of the payer 110 for the bridging service provider 130 to link the payer 110 with the bridged transaction at this step.

In Route (c) as described in steps S303c – S306c, the logo pattern recognition is performed by a bridging system 135 of the bridging service provider 130.

Step S303c: The portable device 115 of the payer 110 scans the target and its nearby regions as a scanned image. Then the portable device 115 transmits the scanned image to an issuer system 125 of the first service provider 120.

Step S305c: The issuer system 125 receives and relays the scanned image to the bridging system 135 of the bridging service provider 130 to identify an acquirer identity of the second service provider. The issuer system 125 may also provide a bridging payer identifier of the payer 110 for the bridging service provider 130 to link the payer 110 with the bridged transaction.

Step S306c: The bridging system 135 performs logo pattern recognition on the scanned image against a library of service providers (pattern library) to find a

match in the library. By identifying what service provider the matched logo belongs to, the acquirer identity of the second service provider may then be identified.

Step S307: Based on the acquirer identity, the bridging system 135 routes the target content to an acquirer system 145 of the correct acquirer (the second service provider 140) to request a transaction.

Step S308: Upon receiving the request from the payer 110, the acquirer system 145 identifies the receiver and transaction related information by resolving the target content.

Step S309: The acquirer system 145 returns a payment request including a receiver identity and/or a receiver name, and other transaction information such as amount and currency, to the bridging system 135.

Step S310: The bridging system relays the payment request to the issuer system 145.

Step S311: The issuer system 145 transmits the payment request to the portable device 115 for the payer's confirmation.

Step S312: The payer 110 then confirms the payment (sometimes also includes entering an amount to be transferred) and returns a confirmation to the issuer system 125.

Step S313: The issuer system 125 relays the confirmation to the bridging system 135.

Step S314: The bridging system 135 executes the transaction, and provides transaction results to the issuer system 125 and the acquirer system 145.

Step S315: The issuer system 125 pushes a notification containing the transaction result to the portable device 115 of the payer 110.

Step S3152: The acquirer system 145 pushes a notification containing the transaction result to the merchant device 155 of the receiver 150.

Consumer Presented Mode Transactions - Case 1

In a bridged transaction of consumer presented mode (CPM), the payer (e.g., the consumer) first requests a bridging target recognizable to an acquirer system of the second service provider for a bridged transaction, so that a bridging system of the bridging service provider returns a target content of the bridging target for the payer's use. This usually means that the payer needs to select a second service provider to generate a corresponding bridging target. PCT International Patent Publication No. WO2023/132995 describes details of requesting a bridging target in bridged transactions. However, selecting a service provider from the list means an extra step (and sometimes human error occurs) when conducting transactions. Therefore, logo pattern recognition can also be applied here to facilitate CPM bridging of transactions.

In one embodiment, before checkout, the payer may scan the acceptance marks of a merchant store. The logo pattern recognition process will indicate what service provider, if any, is acceptable for a bridged transaction (i.e., being a service provider in the bridging network). After recognition, it proceeds with the bridging target generation and the following process of a bridged transaction.

FIG. 4 shows the flow chart of a bridged CPM transaction with logo pattern recognition to identify the second service provider.

Step S401: The payer 110 opens the app and scans the acceptance marks as a scanned image to find a match in a pattern library.

In Route (a) as described in step S402a, the logo pattern recognition is performed by the portable device 115 of the payer 110.

Step S402a: The portable device 115 performs logo pattern recognition on the scanned image against a library of service providers (pattern library) to find matches in the library. By identifying what service provider(s) the matched logo(s) belongs to, a matching acquirer list containing available acquirer(s) may then be generated.

In Route (b) as described in steps S402b – S406b, the logo pattern recognition is performed by an issuer system 125 of the first service provider 120.

Step S402b: The portable device 115 transmits the scanned image to an issuer system 125 of the first service provider 120.

Step S403b: The issuer system 125 performs logo pattern recognition on the scanned image against a library of service providers (pattern library) to find matches in the library. By identifying what service provider(s) the matched logo(s) belongs to, a matching acquirer list containing available acquirer(s) may then be generated.

Step S406b: The issuer system 125 transmits the matching acquirer list to the portable device 115.

In Route (c) as described in steps S402a – S406a, the logo pattern recognition is performed by a bridging system 135 of the bridging service provider 130.

Step S402c: The portable device 115 transmits the scanned image to an issuer system 125 of the first service provider 120.

Step S403c: The issuer system 125 receives and relays the scanned image to the bridging system 135 of the bridging service provider 130. The issuer system 125 may also provide a bridging payer identifier of the payer 110 for the bridging service provider 130 to link the payer 110 with the bridged transaction.

Step S404c: The bridging system 135 performs logo pattern recognition on the scanned image against a library of service providers (pattern library) to find matches in the library. By identifying which service provider(s) the matched logo(s) belongs to, a matching acquirer list containing available acquirer(s) may then be generated.

Step S405c: The bridging system 135 returns the matching acquirer list to the issuer system 125.

Step S406c: The issuer system 125 receives the matching acquirer list and relays it to the portable device 115.

Step S407: If there are more than one match, the app may ask the payer 110 to select one from the matching acquirer list as the acquirer (second service provider 140) to request a bridging target. If there is only one found in the matching acquirer list, the app may automatically send a request to an issuer system 125 of the first service provider. And if no match can be found, the app will perform the traditional route to ask the payer 110 to select a service provider as the acquirer.

Step S408: Based on an acquirer identity of the matched/selected acquirer, the payer 110 sends a target request to an issuer system 125 of the first service provider and requests a bridging target recognizable to the acquirer system 145 of the second service provider 140 for a bridged transaction.

Step S409: The issuer system 125 relays the target request and the acquirer identity to a bridging system 135 of the bridging service provider. The issuer system 125 may also provide a bridging payer identifier of the payer 110 for the bridging service provider 130 to link the payer 110 with the bridged transaction at this step.

Step S410: Based on the acquirer identity, the bridging system 135 routes the target request to an acquirer system 145 of the second service provider 140.

Step S411: The acquirer system 145 returns a target content of the bridging target to the bridging system 135. The target content is recognizable to the acquirer system 145 and a merchant device 155 of the receiver 150.

Step S412: The bridging system 135 relays the target content back to the issuer system 125 of the first service provider 120 based on the target request. The bridging system 135 may also record the linkage between the target content and the payer 110 based on the bridging payer identifier.

Step S413: The issuer system 125 transmits the target content to the portable device 115 of the payer 110.

Step S414: The portable device 115 of the payer 110 generates the bridging target from the target content and presents the bridging target to the receiver 150.

Step S415: A merchant device 155 of the receiver 150 scans the bridging target, and transmits the target content with a payment request including payment amount and currency to the acquirer system 145.

Step S416: The acquirer system 145 recognizes the bridging service provider 130 from the target content, and provides a receiver identity and/or receiver name and the payment request to the bridging system 135 of the bridging service provider 130.

Step S417: The bridging system 130 relays the information to the issuer system 125 of the first service provider for the payer's approval. The bridging system 130 may use the previously recorded linkage to find the first service provider 120 and the payer 110.

If an approval from the payer is required, the steps S418 – S419 will be performed. If the issuer system is authorized to approve the transaction, the steps S418 – S419 may be omitted.

Step S418: The issuer system 125 relays the information to the portable device 115 for the payer's approval.

Step S419: The portable device 115 returns a payment approval to the issuer system 125.

Step S420: The issuer system 125 transmits the payment approval to the bridging system 135.

Step S421: The bridging system 135 executes the transaction, and provides transaction results to the issuer system 125 and the acquirer system 145.

Step S4221: The issuer system 125 pushes a notification containing the transaction result to the portable device 115 of the payer 110.

Step S4222: The acquirer system 145 pushes a notification containing the transaction result to the merchant device 155 of the receiver 150.

Depending on the system's settings, there are also other possible routes of bridged CPM transaction. After S409, the bridging system 135 of the bridging service provider 130 may directly return a target content of the second service provider if it is permitted to do so. For example, the bridging system 135 may be permitted to generate target content recognizable to the acquirer system 145. The bridging system 135 may also receive target contents of multiple bridging targets beforehand and simply return one without notifying the acquirer system 145 when receiving a target request from the issuer system 125. The following steps (S412-S4222) after returning a target content are the same as those of the previous route.

Consumer Presented Mode Transactions - Case 2

In the above examples, the payer is the party to present or scan the target of another service provider. As such, the receiver (usually merchant stores) may accept bridged transactions with their existing infrastructure (such as POS system). However, receivers may also modify their systems to accept targets of other service providers.

In this example, the receiver (instead of the payer) performs logo pattern recognition to identify the issuer (first service provider) in bridged transactions. A merchant device (such as POS system) scans a target of payer which has an embedded logo identifying the service provider the payer is affiliated to. The merchant device along with the receiver's backend system will perform pattern recognition to identify the issuer (payer's service provider) and route the payment request to the issuer accordingly. This may be achieved if the acquirer system has a way to route payment request through a direct interface with the issuer system, through an aggregator interfaces with the issuer system, or via a platform of a bridging network such as a bridging system of a bridging service provider.

FIG. 5 shows the flow chart of another bridged CPM transaction, wherein the merchant device of the receiver and/or the acquirer system performs logo pattern recognition to identify the first service provider.

Step S501: The portable device 115 of the payer 110 presents a payer target of the first service provider 120 to the receiver 150.

In Route (a) as described in steps S502a – S505a, the logo pattern recognition is performed by the merchant device 155 of the receiver 150.

Step S502a: The merchant device 155 of the receiver 150 scans the target and its nearby regions as a scanned image, and performs logo pattern recognition on the scanned image against a library of service providers (pattern library) to find

a match in the library. By identifying which service provider the matched logo belongs to, an issuer identity of the first service provider may then be identified.

Step S503a: The merchant device 155 then resolves the payer target to get a target content, and transmits the target content and the issuer identity to an acquirer system 145 of the second service provider 140. The merchant device 155 may also provide a payment request containing one or more transaction related details such as receiver name, transaction amount, and currency.

Step S505a: To identify the payer 110, the acquirer system 145 relays the target content and the issuer identity to a bridging system 135 of the bridging service provider 130. The acquirer system 145 may also provide a bridging receiver identifier of the receiver 150 for the bridging service provider 130 to link the receiver 150 with the bridged transaction. The acquirer system 145 may also transmit the payment request to the bridging system 135.

In Route (b) as described in steps S503b – S505b, the logo pattern recognition is performed by an acquirer system 145 of the second service provider 140.

Step S503b: The merchant device 155 of the receiver 150 scans the payer target and its nearby regions as a scanned image. Then the merchant device 155 transmits the scanned image to an acquirer system 145 of the second service provider 140.

Step S504b: The issuer system 145 performs logo pattern recognition on the scanned image against a library of service providers (pattern library) to find a match in the library. By identifying which service provider the matched logo belongs to, the issuer identity of the first service provider may then be identified.

Step S505b: To identify the payer 110, the acquirer system 145 resolves the payer target to get a target content, and transmits the target content and the issuer

identity to a bridging system 135 of the bridging service provider 130. The acquirer system 145 may also provide a bridging receiver identifier of the receiver 150 for the bridging service provider 130 to link the receiver 150 with the bridged transaction. The acquirer system 145 may also transmit the payment request to the bridging system 135.

In Route (c) as described in steps S503c – S506c, the logo pattern recognition is performed by a bridging system 135 of the bridging service provider 130.

Step S503c: The merchant device 155 of the receiver 150 scans the payer target and its nearby regions as a scanned image. Then the merchant device 155 transmits the scanned image to an acquirer system 145 of the second service provider 140.

Step S505c: The acquirer system 145 receives and relays the scanned image to the bridging system 135 of the bridging service provider 130 to identify an issuer identity of the first service provider. The acquirer system 145 may also provide a bridging receiver identifier of the receiver 150 for the bridging service provider 130 to link the receiver 150 with the bridged transaction.

Step S506c: The bridging system 135 performs logo pattern recognition on the scanned image against a library of service providers (pattern library) to find a match in the library. By identifying which service provider the matched logo belongs to, the issuer identity of the first service provider may then be identified. Then the bridging system 135 resolves the payer target to get a target content.

The following steps will be performed if the acquirer system is configured to confirm the payer target successfully routed to the issuer system and can be used in

a bridged transaction before transmitting transaction details such as receiver name, payment amount and currency to the bridging system.

Step S601: Based on the issuer identity, the bridging system 135 routes the target content to an issuer system 125 of the correct issuer (the first service provider 120) to request a bridged transaction.

Step S602: Upon receiving the request from the receiver 150, the issuer system 125 identifies the payer 110 by resolving the target content.

Step S603: The issuer system 125 returns a confirmation for successful resolve of the payer target. The issuer system 125 may also provide a bridging payer identifier of the payer 110 for the bridging service provider 130 to link the payer 110 with the bridged transaction.

Step S604: The bridging system 135 relays the confirmation to the acquirer system 145.

Step S605: The acquirer system 145 provides the payment request containing receiver name, transaction amount, and currency to the bridging system 135.

Step S606: The bridging system 135 relays the payment request to the issuer system 125 for approval.

Step S607: The issuer system approves the payment request and returns a confirmation to the bridging system 135.

Alternatively, the acquirer system may also transmit the transaction details directly to the bridging system without knowing whether the payer target can be routed to the issuer or not. In this case, the following steps are performed.

Step S507: Based on the issuer identity, the bridging system 135 routes the target content to an issuer system 125 of the correct issuer (the first service

provider 120) to request a bridged transaction. The payment request containing transaction details is also provided to the issuer system 125.

Step S508: Upon receiving the request from the receiver 150, the issuer system 125 identifies the payer 110 by resolving the target content. Then the issuer system 125 may confirm the payment by its own if it is allowed to do so, or it may transmit the payment request to the portable device 115 for the payer's approval.

Step S509: After the payment request is approved, the issuer system 125 provides a confirmation to the bridging system 135 to approve the transaction. The issuer system 125 may also provide a bridging payer identifier of the payer 110 for the bridging service provider 130 to link the payer 110 with the bridged transaction.

Step S510: The bridging system 135 execute the transaction, and provides transaction results to the issuer system 125 and the acquirer system 145.

Step S511: The issuer system 125 pushes a notification containing the transaction result to the portable device 115 of the payer 110.

Step S512: The acquirer system 145 pushes a notification containing the transaction result to the merchant device 155 of the receiver 150.

Service Provider Logo / Name Placement

The portable device of payer and/or the merchant device of receiver are configured to recognize a logo or name in a logo embedded target. The placement of the logos and names in a target (such as a QR code) can be placed in the center of the QR code, as shown in FIG. 6A. It may also be at any position inside of the target (such as a logo in QR code with compliance to the QR standards) and still provide scan readability and accuracy, like the one shown in FIG. 6B. In some scenarios such as CPM transactions using bridging targets, only the logo or name of a service

provider is required, and the logo or name may be placed at any location on a display stand or board indicating the acceptable acquirers of a merchant.

Scanning Process

The scanning and decoding of logo embedded target may involve a sequence of, but not limited to the following actions: (1) image capture, (2) image processing, (3) detection and localization, (4) decoding, (5) error correction, (6) data interpretation, and (7) execution. The logo pattern recognition process is able to recognize a correct match from the pattern library even though the logo in the scanned image is distorted or damaged and is not 100% matching to the logo (s) stored in the library.

Payer and Receiver Linkage in Bridging System

As described above, both the issuer system and the acquirer system may provide user identifiers for the bridging system to link the payer and the receiver with the bridged transaction.

In one embodiment, every payer/ receiver is required to register with a user identifier in the bridging system to conduct bridged transactions. The bridging system of the bridging service provider assigns a bridging user identifier to a user (payer or receiver) who is new to the bridging network. Then the mobile payment service provider the user affiliated to may record the assigned bridging user identifier, and provide the bridging user identifier to the bridging system for later bridged transactions. As such, a bridging user identifier is uniquely mapped to a user of a service provider. Several different bridging user identifiers may be assigned to the same person, if he or she has accounts registered in different service providers. Each single account corresponds to a bridging user identifier. In a bridged transaction, the bridging user identifier assigned to the payer is called the

bridging payer identifier, and the bridging user identifier assigned to the receiver is called the bridging receiver identifier.

The bridging system also assigns a bridging transaction identifier to a bridged transaction. A bridging transaction identifier is usually assigned when the bridging system receives a request for a bridged transaction from the issuer system or the acquirer system. Then the bridging system may link the two users of a bridged transaction together with the bridging transaction identifier.

Referring to FIG. 3, the bridging system may use bridging transaction identifier in bridged MPM transactions.

In step S305a, S305b or S305c, the issuer system 125 first check whether the payer 110 is new to the bridging network or has already registered the account with a bridging user identifier (the bridging payer identifier). If the payer is new to the bridging network, the issuer system 125 will register the payer in the bridging system 135 of the bridging service provider 130 first. The bridging system then assigns a bridging user identifier to the payer 110 as the bridging payer identifier, and returns the bridging payer identifier to the issuer system 125. The issuer system then may record the bridging payer identifier for future use. And if the payer 110 has already registered the account in the bridging system 135 with a bridging user identifier, the issuer system will directly provide the bridging user identifier to the bridging system 135 as the bridging payer identifier.

After receiving a transaction request and the bridging payer identifier associated with the request, the bridging system 135 assigns a bridging transaction identifier to the new transaction initiated by the payer, and links the bridging payer identifier with the bridging transaction identifier.

In step S309, after identifying the receiver identity, the acquirer system 145 performs a check similar to what the issuer system does in step S305a/S305b/

S305c to check whether the receiver is registered with a bridging user identifier in the bridging network. If yes, the acquirer system 145 will return the registered bridging user identifier as the bridging receiver identifier; if no, the acquirer system 145 will register the receiver 150 in the bridging system 135, and the bridging system 135 will assign a bridging user identifier to the receiver 150 as the bridging receiver identifier.

After receiving the bridging receiver identifier with the payment request, the bridging system 135 links the bridging receiver identifier with the bridging transaction identifier, and so both the payer 110 and the receiver 150 can be linked to the bridging transaction identifier. By using the bridging transaction identifier, the bridging system 135 can identify the payer 110 and the receiver 150 by the linked bridging payer identifier and bridging receiver identifier.

Referring to FIG. 4, the bridging system may also use bridging transaction identifier in bridged CPM transactions.

In step S402b, S402c or S408, the issuer system first checks whether the payer 110 is new to the bridging network or has already registered the account with a bridging user identifier (the bridging payer identifier). If the payer is new to the bridging network, the issuer system 125 will register the payer in the bridging system 135 of the bridging service provider 130 first. The bridging system then assigns a bridging user identifier to the payer 110 as the bridging payer identifier, and returns the bridging payer identifier to the issuer system 125. The issuer system then may record the bridging payer identifier for future use. And if the payer 110 has already registered the account in the bridging system 135 with a bridging user identifier, the issuer system will directly provide the bridging user identifier to the bridging system 135 as the bridging payer identifier.

After receiving a target request and the bridging payer identifier associated with the request, the bridging system 135 assigns a bridging transaction identifier to the target request, and link the bridging transaction identifier with the bridging payer identifier.

In step S416, the acquirer system 145 checks whether the receiver is registered with a bridging user identifier in the bridging network. If yes, the acquirer system 145 will provide the registered bridging user identifier to the bridging system 135 as the bridging receiver identifier; if no, the acquirer system 145 will register the receiver 150 in the bridging system 135, and the bridging system 135 will assign a bridging user identifier to the receiver 150 as the bridging receiver identifier.

After receiving the bridging receiver identifier with the payment request, the bridging system 135 links the bridging receiver identifier with the bridging transaction identifier, and so both the payer 110 and the receiver 150 can be linked to the bridging transaction identifier. By using the bridging transaction identifier, the bridging system 135 can identify the payer 110 and the receiver 150 by the linked bridging payer identifier and bridging receiver identifier.

In step S417, the bridging system 130 relays the information to the issuer system 125 of the first service provider for the payer's approval. The bridging system 130 may use the previously recorded linkage to find the first service provider 120 and the payer 110.

The foregoing description of embodiments is provided to enable any person skilled in the art to make and use the subject matter. Various modifications to these embodiments will be readily apparent to those skilled in the art, and the novel principles and subject matter disclosed herein may be applied to other embodiments without the use of the innovative faculty. The claimed subject matter

set forth in the claims is not intended to be limited to the embodiments shown herein but is to be accorded the widest scope consistent with the principles and novel features disclosed herein. It is contemplated that additional embodiments are within the spirit and true scope of the disclosed subject matter. Thus, it is intended that the present invention covers modifications and variations that come within the scope of the appended claims and their equivalents.

WHAT IS CLAIMED IS:

1. A method for bridging a transaction between a payer of a first service provider and a receiver of a second service provider, comprising:
 - wirelessly receiving, by an issuer system of the first service provider, (1) a scanned image of a logo embedded target of the second service provider or (2) a target content of the logo embedded target and an acquirer identity of the second service provider, from a portable device of the payer;
 - if the issuer system wirelessly receives the scanned image of the logo embedded target from the portable device, performing, by the issuer system, logo pattern recognition on the scanned image against a library of service providers to identify the acquirer identity of the second service provider;
 - providing, by the issuer system, the target content and the acquirer identity to a bridging system of a bridging service provider; and
 - receiving, by the issuer system, a payment request generated based on the target content of the logo embedded target, from the bridging system; wherein: the acquirer identity of the second service provider is identified by logo pattern recognition on the scanned image against a library of service providers; and the first service provider is different from the second service provider.
2. The method of claim 1, wherein the logo embedded target is a QR code with a logo or name of the second service provider.
3. The method of claim 1, wherein:
 - the issuer system wirelessly receives the target content and the acquirer identity from the portable device; and
 - the logo pattern recognition on the scanned image is performed by the

portable device of the payer.

4. The method of claim 1, after receiving the payment request from the bridging system further comprising:
 - providing, by the issuer system, the payment request to the portable device of the payer;
 - receiving, by the issuer system, a payment approval from the portable device to confirm the payment request; and
 - providing, by the issuer system, the payment approval to the bridging system.
5. The method of claim 1, wherein the target content is parsed into the payment request by the bridging system.
6. The method of claim 1, wherein the target content is parsed into the payment request by an acquirer system of the second service provider.
7. The method of claim 1, wherein the issuer system further provides a bridging payer identifier to the bridging system, and further receives a bridging transaction identifier from the bridging system.
8. The method of claim 7, wherein the bridging payer identifier identifies the payer in the bridging system.
9. The method of claim 7, wherein the bridging transaction identifier is generated by the bridging system to identify the transaction in the bridging system.

10. A method for bridging a transaction between a payer of a first service provider and a receiver of a second service provider, comprising:

receiving, by a bridging system of a bridging service provider, (1) a scanned image of a logo embedded target of the second service provider or (2) a target content of the logo embedded target and an acquirer identity of the second service provider, from an issuer system of the first service provider;

if the bridging system wirelessly receives the scanned image of the logo embedded target from the issuer system, performing, by the bridging system, logo pattern recognition on the scanned image against a library of service providers to identify the acquirer identity of the second service provider;

providing, by the bridging system, the target content to an acquirer system of the second service provider based on the acquirer identity;

receiving, by the bridging system, a payment request generated based on the target content from the acquirer system; and

providing, by the bridging system, the payment request to the issuer system; wherein:

the acquirer identity of the second service provider is identified by logo pattern recognition on the scanned image against a library of service providers; and the first service provider is different from the second service provider.

11. The method of claim 10, wherein the logo embedded target is a QR code with a logo or name of the second service provider.

12. The method of claim 10, after receiving the payment request from the acquirer system further comprising:

receiving, by the bridging system, a payment approval from the issuer system to confirm the payment request; and

providing, by the bridging system, a transaction result to the issuer system and the acquirer system.

13.The method of claim 10, wherein the target content is parsed into the payment request by the bridging system.

14.The method of claim 10, wherein the target content is parsed into the payment request by the acquirer system.

15.The method of claim 10, wherein:

in the step of receiving the scanned image or the acquirer identity and the target content, the bridging service provider further receives a bridging payer identifier from the issuer system;

in the step of providing the target content, the bridging service provider further provides a bridging transaction identifier to the acquirer system;

in the step of receiving the payment request, the bridging service provider further receives a bridging receiver identifier from the acquirer system; and

in the step of providing the payment request, the bridging service provider further provides the bridging payer identifier to the issuer system.

16.The method of claim 15, wherein the bridging payer identifier and the bridging receiver identifier are mapped to the bridging transaction identifier in the bridging system.

17.The method of claim 15, wherein the bridging payer identifier identifies the payer in the bridging system.

18. The method of claim 15, wherein the bridging receiver identifier identifies the receiver in the bridging system.
19. The method of claim 15, wherein the bridging transaction identifier is generated by the bridging system to identify the transaction in the bridging system.
20. A method for bridging a transaction between a payer of a first service provider and a receiver of a second service provider, comprising:
- wirelessly receiving, by an issuer system of the first service provider, a target request comprising an acquirer identity of the second service provider, from a portable device of the payer for a target content of the second service provider;
 - providing, by the issuer system, the target request to the bridging system;
 - receiving, by the issuer system, the target content of the second service provider from the bridging system; and
 - providing, by the issuer system, the target content to the portable device of the payer; wherein:
 - the acquirer identity is selected from a matching acquirer list generated based on logo pattern recognition on a scanned image against a library of service providers, and the scanned image comprises one or more logos of service providers; and
 - the first service provider is different from the second service provider.
21. The method of claim 20, before wirelessly receiving the target request further comprising:
- receiving, by the issuer system, the scanned image from the portable device;
 - performing, by the issuer system, logo pattern recognition on the scanned

image against a library of service providers to generate the matching acquirer list; and

wirelessly providing, by the issuer system, the matching acquirer list to the portable device.

22. The method of claim 20, wherein the logo pattern recognition is performed by the portable device of the payer.

23. The method of claim 20, after providing the target content to the portable device further comprising:

receiving, by the issuer system, a payment request generated based on the target content from the bridging system; and

providing, by the issuer system, a payment approval to confirm the payment request.

24. The method of claim 20, wherein the issuer system further provides a bridging payer identifier to the bridging system, and further receives a bridging transaction identifier from the bridging system.

25. The method of claim 24, wherein the bridging payer identifier identifies the payer in the bridging system.

26. The method of claim 24, wherein the bridging transaction identifier is generated by the bridging system to identify the transaction in the bridging system.

27. A method for bridging a transaction between a payer of a first service provider and a receiver of a second service provider, comprising:

receiving, by a bridging system of a bridging service provider, a target request comprising an acquirer identity of the second service provider from an issuer system of the first service provider; and

providing, by the bridging system, a target content of the second service provider to the issuer system; wherein:

the acquirer identity is selected from a matching acquirer list generated based on logo pattern recognition on a scanned image against a library of service providers, and the scanned image comprises one or more logos of service providers; and

the first service provider is different from the second service provider.

28. The method of claim 28, before receiving the target request further comprising:

receiving, by the bridging system, the scanned image from the issuer system;

performing, by the bridging system, logo pattern recognition on the scanned image against a library of service providers to generate the matching acquirer list; and

providing, by the issuer system, the matching acquirer list to the issuer system.

29. The method of claim 27, wherein the logo pattern recognition is performed by a portable device of the payer or the issuer system of the first service provider.

30. The method of claim 27, before providing the target content to the issuer system further comprising:

providing, by the bridging system, the target request to the acquirer system of the second service provider based on the acquirer identity;

receiving, by the bridging system, the target content from the acquirer system.

31. The method of claim 27, after providing the target content to the issuer system further comprising:

receiving, by the bridging system, a payment request generated based on the target content from an acquirer system of the second service provider;

providing, by the bridging system, the payment request to the issuer system;

receiving, by the bridging system, a payment approval from the issuer system to confirm the payment request; and

providing, by the bridging system, a transaction result to the issuer system and the acquirer system.

32. The method of claim 27, wherein the target content is used to generate the payment request by the acquirer system.

33. The method of claim 31, wherein:

in the step of receiving the target request, the bridging service provider further receives a bridging payer identifier from the issuer system;

after receiving the target request, the bridging service provider generates a bridging transaction identifier and provides the bridging transaction identifier to the acquirer system;

in the step of receiving the payment request, the bridging service provider further receives a bridging receiver identifier from the acquirer system; and

in the step of providing the payment request, the bridging service provider further provides the bridging payer identifier to the issuer system.

34. The method of claim 33, wherein the bridging payer identifier and the bridging receiver identifier are mapped to the bridging transaction identifier in the bridging system.
35. The method of claim 33, wherein the bridging payer identifier identifies the payer in the bridging system.
36. The method of claim 33, wherein the bridging receiver identifier identifies the receiver in the bridging system.
37. A method for bridging a transaction between a payer of a first service provider and a receiver of a second service provider, comprising:
- receiving, by an acquirer system of the second service provider, (1) a scanned image of a logo embedded target of the first service provider or (2) a target content of the logo embedded target and an issuer identity of the first service provider, from a merchant device of the receiver;
 - if the acquirer system receives the scanned image of the logo embedded target from the merchant device, performing, by the acquirer system, logo pattern recognition on the scanned image against a library of service providers to identify the issuer identity of the first service provider; and
 - providing, by the acquirer system, the target content, the issuer identity and a payment request to a bridging system of a bridging service provider;
- wherein:
- the issuer identity of the first service provider is identified by logo pattern recognition on the scanned image against a library of service providers
 - the payment request is generated based on transaction information provided by the receiver; and

the first service provider is different from the second service provider.

38. The method of claim 37, wherein the logo embedded target is a QR code with a logo or name of the first service provider.

39. The method of claim 37, wherein:

the acquirer system receiving the target content and the issuer identity from the merchant device; and

the logo pattern recognition on the scanned image is performed by the merchant device of the receiver.

40. The method of claim 37, wherein the acquirer system further provides a receiver identifier to the bridging system, and further receives a bridging transaction identifier from the bridging system.

41. The method of claim 40, wherein the receiver identifier identifies the receiver in the bridging system.

42. The method of claim 40, wherein the bridging transaction identifier is generated by the bridging system to identify the transaction in the bridging system.

43. A method for bridging a transaction between a payer of a first service provider and a receiver of a second service provider, comprising:

receiving, by a bridging system of a bridging service provider, (1) a scanned image of a logo embedded target of the first service provider or (2) a target content of the logo embedded target and an issuer identity of the first service provider, from an acquirer system of the second service provider;

if the bridging system receives the scanned image of the logo embedded target from the acquirer system, performing, by the bridging system, logo pattern recognition on the scanned image against a library of service providers to identify the issuer identity of the first service provider;

providing, by the bridging system, the target content and a payment request to an issuer system of the first service provider based on the issuer identity; and

receiving, by the bridging system, a payment approval from the issuer system; wherein:

the issuer identity of the first service provider is identified by logo pattern recognition on the scanned image against a library of service providers

the payment request is generated based on transaction information provided by the receiver; and

the first service provider is different from the second service provider.

44.The method of claim 43, wherein the logo embedded target is a QR code with a logo or name of the first service provider.

45.The method of claim 43, after receiving the payment approval from the issuer system further comprising:

executing, by the bridging system, the transaction based on the payment request and the payment approval; and

providing, by the bridging system, a transaction result to the issuer system and the acquirer system.

46.The method of claim 43, wherein:

in the step of receiving the scanned image or the issuer identity and the

target content, the bridging service provider further receives a bridging receiver identifier from the acquirer system;

in the step of providing the target content, the bridging service provider further provides a bridging transaction identifier to the issuer system; and

in the step of receiving the payment approval, the bridging service provider further receives a bridging payer identifier from the issuer system.

47. The method of claim 46, wherein the bridging payer identifier and the bridging receiver identifier are mapped to the bridging transaction identifier in the bridging system.

48. The method of claim 46, wherein the bridging payer identifier identifies the payer in the bridging system.

49. The method of claim 46, wherein the bridging receiver identifier identifies the receiver in the bridging system.

50. The method of claim 46, wherein the bridging transaction identifier is generated by the bridging system to identify the transaction in the bridging system.