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Real Time Settlement of Card Transactions to Enable Instant Payments to Merchants

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TECHNICAL FIELD

The present invention, in general, relates to card based instant payment systems, and more particularly, but not exclusively to a system and a method for real time settlement of card based transactions to enable instant payments to merchants.

BACKGROUND

The adoption of digital payment methods at merchants has been increasing globally, but cash still remains a widely used form of payments in many parts of the world, especially in some developing countries or regions the cash payments continue to be more prevalent. One of the reasons for this low adoption rate to digital payments by merchants is unavailability of instant payment system to merchants. For instance, there are many merchants or sellers who operate at a very small scale with limited funds. These merchants heavily depend on daily cash flow. The cash collected from sales in a day is partly used to buy the inventory of the next day, manage their daily family expenses etc. Liquidity is an important factor for their survival. Hence, these merchants have been very hesitant to adopt to digital payments. Though in recent times, they have adopted to instant payment methods like UPI but are still reluctant to adopt to payment systems involving payment cards (credit card, debit card etc.) as the settlement takes several hours to several days for card payment transactions.

Further, there are many countries or regions where UPI payment facility is not available, so these merchants are still not able to utilize the benefits of digital payments. There are millions of such merchants like local shops, mom-and-pop stores, individual sellers, etc. across the globe and if these merchants are brought under the digital payment eco-system, it would help to grow their businesses.

Furthermore, there are a large number of small merchants who are still not part of digital payment ecosystem especially card payment ecosystem. The low adoption rate of card based payment systems by small merchants is mainly due to non-availability of real time settlement of card transactions and instant payment feature to merchants.

Therefore, there is a need for techniques to efficiently establish the card based payment systems for small merchants.

SUMMARY

The present invention provides a system and method for real time settlement of card based payment transactions. The solution would focus on developing a real time settlement process for card payment transactions made at the small sellers / merchants. The proposed real time settlement of card transactions and instant payment feature may bring in millions of small merchants into the card payment ecosystem by solving their concerns on liquidity.

In a non-limiting aspect, the system for the high-level design and implementation of card payment transactions comprises:

1. Acquirers may sign-up/enroll merchants for accepting card payments (for the respective payment networks) like any other existing merchants.

2. A new flag or indicator may be used to be populated for the card payment transactions made at the point-of-sale (POS) terminals of these merchants and the new flag or indicator field may be part of the authorization request and response message that helps in identifying the transactions coming from these merchants. The authorization requests process would remain exactly similar to the methods currently followed by all other merchants.

3. Once the card payment transaction is authorized by the issuer, the acquirer may send the response back to merchants as it is done currently, a new process may be introduced at the acquirer side to check if the transaction is from a small merchant who got on-boarded with agreement to have the benefits of real time settlement.

4. If the transaction is approved by the issuer and happened to be from such merchants, then acquirer may pay the merchants instantly after deducting the interchange fee. Further, the card transactions in such merchants may be always billed/settled in local currency to keep the interchange fee calculation simple.

5. The acquirer may initiate the settlement request in batches as they do today.

6. During the batch settlement among issuers, payment networks, acquirers and merchants, the process at the issuer and payment networks may remain same. Further, the acquirer may not pay these merchants again as transactions amount were already paid/settled on real time. Acquirer may reconcile the batch settlement data and the real time settlement made with these merchants to verify the accuracy.

7. The real time settlement functionality may be extended to other existing merchants as well.

The foregoing summary is illustrative only and is not intended to be in any way limiting. In addition to the illustrative aspects, embodiments, and features described above, further aspects, embodiments, and features will become apparent by reference to the drawings and the following detailed description.

DESCRIPTION OF DRAWINGS

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

Figure 1A illustrates the system for real-time settlement of card based payment transactions in accordance with some embodiments of the present invention.

Figure 1B illustrates the method for enabling the authorization process and real time settlement of card based payment transactions in accordance with some embodiments of the present invention.

Figure 2 illustrates the method for batch settlement of payment transactions on real time in accordance with some embodiments of the present invention.

Figure 3 illustrates a block diagram of an exemplary computer system for implementing embodiments consistent with the present disclosure.

It should be appreciated by those skilled in the art that any block diagrams herein represent conceptual views of illustrative systems embodying the principles of the present subject matter. Similarly, it will be appreciated that any flowcharts, flow diagrams, state transition diagrams, pseudo code, and the like represent various processes which may be substantially represented in computer readable medium and executed by a computer or processor, whether or not such computer or processor is explicitly shown.

DETAILED DESCRIPTION

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

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

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

In the following detailed description of the embodiments of the disclosure, reference is made to the accompanying drawings that form a part hereof, and in which are shown by way of illustration specific embodiments in which the disclosure may be practiced. These embodiments are described in sufficient detail to enable those skilled in the art to practice the disclosure, and it is to be understood that other embodiments may be utilized and that changes may be made without departing from the scope of the present disclosure. The following description is, therefore, not to be taken in a limiting sense.

Embodiments of the present invention are directed to systems and methods for real-time settlement of card based payment transactions. For example, the present invention focus on developing a real time settlement process for card payment transactions made at the small merchants. Further, the proposed real time settlement of card transactions and instant payment feature brings in millions of small merchants into the card payment ecosystem by solving their concerns on liquidity.

Fig. 1A illustrates a system 100a for real-time settlement of card based payment transactions in accordance with some embodiments of the present invention. The system comprise a payment network 101 configured to make a payment transaction between an acquirer 103 and

a seller 104, authorized by an issuer 102. For example, the payment network 101 is a Near-field communication (NFC) enabled Point of sale (PoS) system, performs in accordance with networks like Visa, Mastercard, or like. Further, the present system refers to payments to any seller or merchant who operates on a very small scale or micro scale with limited funds, particularly, the sellers heavily depend on daily cash flow, but it shall not considered as limiting. For instance, the seller is considered to be sellers of local shops, mom-and-pop stores, individual sellers, grocery shops, vegetable vendors, street side or road side sellers, fixed shop retailers, and so on, but not limited thereto. In an embodiment, the disclosure may be implemented in any seller facility that accepts payment in cash.

Fig. 1B illustrates a method for enabling an authorization process and real time settlement of card based payment transactions between an acquirer 113 and a seller 120 through an issuer 112 via payment networks 111 in accordance with some embodiments of the present invention. For instance, the acquirer 113 may undergo an authorization process after signing-up/enrolling the seller 120 for accepting card payments (for the respective payment networks) like any other existing sellers / merchants. In an embodiment, the authorization process may involve sending an authorization request for card transactions 114a to any of the above-mentioned payment network 111 but not limiting thereto, by the acquirer 113. After processing the authorization request 114a by the payment network 111, an authorization request 114b may be sent to the issuer 112.

On analyzing the authorization request 114b, an authorization response 115b may be sent by the issuer 112 to the payment network 111, where the authorization response 115b may be either an approval or decline of authorization for the seller 120 in regard to card transactions based on some limiting conditions to be discussed later. Further, the approval or decline of authorization received from the issuer 112 may be forwarded as an authorization response 115a to the acquirer 113 via the payment network 111 This authorization response 115a may be either an approval of authorization or decline of authorization based on the discretion of the issuer 112, based on the same limiting conditions.

A new flag or indicator may be created for the card payment transactions made at the point-of-sale (POS) terminals of the sellers 120 and the new flag or indicator field may be part of the authorization request and response message that helps in identifying the transactions proceeded from the sellers 120. However, the authorization requests process may remain exactly similar to the methods currently followed by all other sellers.

In a non-limiting aspect, the system 100b for card based payment transactions including the transmission of authorization request and response message between the acquirer 113 and the issuer 112 through the payment network 111. Once the card payment transaction is authorized by the issuer 112, the acquirer 113 may send the approved response back to the seller 120 as it is done currently. A similar process of sending an authorization request for card transactions 114c by the seller 120 to the acquirer 113 and receiving an authorization response 115c from the acquirer 113 to the seller 120, based on the same limiting conditions of the issuer 112 is carried out as an initial process of card based payment transactions.

 In an embodiment, the above-mentioned limiting conditions of the issuer 112 on accepting or declining the card transactions between the acquirer 113 and the seller 120 involves a new process of introducing a checking at the acquirer 113 whether the transaction is from a small merchant / seller (operating at a very small scale or micro scale with limited funds) who got on-boarded with the agreement to have the benefits of the real time settlement. In that scenario, only when the card transaction is approved by the issuer 112 and happened to be from such small merchants, the process of verifying whether the seller 120 is enrolled for a real time settlement 116 by the acquirer 113. Once it is found that the seller 120 is enrolled for the real time settlement 117, then the acquirer 113 shall pay the seller 120 instantly after deducting the interchange fee on real time 118. Thus, the required fund is transferred 119 to the seller 120 in accordance with the real time basis. Further, the card transactions in such merchants shall be always billed/settled in local currency to keep the interchange fee calculation simple. Thus, the method of establishing a low adoption rate of card based payment transactions that includes the authorization process and the real time settlement in accordance with some embodiments of the present invention are disclosed .

In another embodiment, Fig. 2 illustrates a method 200 for batch settlement of payment transactions on real time in accordance with some embodiments of the present invention. For instance, an acquirer 212 may initiate a request for batch settlement (i.e., in batches) as they do every day and submit the batch settlement request 208 to payment networks 206. Further, the batch settlement among issuers, payment networks, acquirers and merchants, the process at an issuer 202 and payment networks 206 may remain same as explained in Fig. 1B, but not limiting to. Once the batch settlement request is approved by the issuer 202, an acceptance for fund transfer based on the batch settlement process 204 is sent to the payment networks 206 by the issuer 202. Hence, the required fund is transferred for batch settlement transactions 210 from the payment networks 206 to the acquirer 212.

In an embodiment, the acquirer 212 may verify whether the seller 218 is enrolled for real time settlement 214 or not. If yes, the acquirer 212 may not pay these merchants again as transactions amount was already paid on real time. Further, the acquirer 212 may reconcile the batch settlement data and the real time settlement made with these merchants to verify the accuracy. Otherwise, the acquirer 212 may be settling the merchant 216 on the real time settlement functionality that may be extended to other existing merchants as well. Thus, the method 200 for batch settlement of payment transactions on the real time in accordance with some embodiments of the present invention is disclosed. In an embodiment, there will be no change to existing batch settlement process as shown in Fig. 2, where the acquirer 212 may add a check point (blocks in grey color) to verify if the merchants are already settled by real time process and transfer funds to the merchants accordingly.

Fig. 3 illustrates a block diagram of an exemplary computer system for implementing embodiments consistent with the present disclosure.

In an embodiment, the computer system 300 may be used to implement the system. The computer system 300 may include a central processing unit ("CPU" or "processor") 302. The processor 302 may include at least one data processor for providing a unique identifier for payment. The processor 302 may include specialized processing units such as, integrated system (bus) controllers, memory management control units, floating point units, graphics processing units, digital signal processing units, etc.

The processor 302 may be disposed in communication with one or more Input/Output (I/O) devices (312 and 313) via I/O interface 301. The I/O interface 301 employ communication protocols/methods such as, without limitation, audio, analog, digital, monoaural, Radio Corporation of America (RCA) connector, stereo, IEEE-1394 high speed serial bus, serial bus, Universal Serial Bus (USB), infrared, Personal System/2 (PS/2) port, Bbayonet Neill-Concelman (BNC) connector, coaxial, component, composite, Digital Visual Interface (DVI), High-Definition Multimedia Interface (HDMI), Radio Frequency (RF) antennas, S-Video, Video Graphics Array (VGA), IEEE 802.11b/g/n/x, Bluetooth, cellular e.g., Code-Division Multiple Access (CDMA), High-Speed Packet Access (HSPA+), Global System for Mobile communications (GSM), Long-Term Evolution (LTE), Worldwide Interoperability for Microwave access (WiMax), or the like, etc.

Using the I/O interface 301, the computer system 300 may communicate with one or more I/O devices such as input devices 312 and output devices 313. For example, the input devices 312

may be an antenna, keyboard, mouse, joystick, (infrared) remote control, camera, card reader, fax machine, dongle, biometric reader, microphone, touch screen, touchpad, trackball, stylus, scanner, storage device, transceiver, video device/source, etc. The output devices 313 may be a printer, fax machine, video display (e.g., Cathode Ray Tube (CRT), Liquid Crystal Display (LCD), Light-Emitting Diode (LED), plasma, Plasma Display Panel (PDP), Organic Light-Emitting Diode display (OLED) or the like), audio speaker, etc.

In some embodiments, the processor 302 may be disposed in communication with a communication network 309 via a network interface 303. The communication network 309 may couple the processor 302 with the database 103. The network interface 303 may communicate with the communication network 309. The network interface 303 may employ connection protocols including, without limitation, direct connect, ethernet (e.g., twisted pair 10/100/1000 Base T), Transmission Control Protocol/Internet Protocol (TCP/IP), token ring, IEEE 802.11a/b/g/n/x, etc. The communication network 309 may include, without limitation, a direct interconnection, Local Area Network (LAN), Wide Area Network (WAN), wireless network (e.g., using Wireless Application Protocol), the Internet, etc. Using the network interface 303 and the communication network 309, the computer system 300 may communicate with a database 314, which may be the enrolled templates database 313. The network interface 303 may employ connection protocols include, but not limited to, direct connect, ethernet (e.g., twisted pair 10/100/1000 Base T), Transmission Control Protocol/Internet Protocol (TCP/IP), token ring, IEEE 802.11a/b/g/n/x, etc.

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

In some embodiments, the processor 302 may be disposed in communication with a memory 305 (e.g., RAM, ROM, etc. not shown in Fig. 3) via a storage interface 304. The storage interface 304 may connect to memory 305 including, without limitation, memory drives,

removable disc drives, etc., employing connection protocols such as, Serial Advanced Technology Attachment (SATA), Integrated Drive Electronics (IDE), IEEE-1394, Universal Serial Bus (USB), fiber channel, Small Computer Systems Interface (SCSI), etc. The memory drives may further include a drum, magnetic disc drive, magneto-optical drive, optical drive, Redundant Array of Independent Discs (RAID), solid-state memory devices, solid-state drives, etc.

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

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

In some embodiments, the computer system 300 may implement web browser 308 stored program components. Web browser 308 may be a hypertext viewing application, such as Microsoft™ Internet Explorer™, Google Chrome™, Mozilla Firefox™, Apple™ Safari™, etc. Secure web browsing may be provided using secure hypertext transport protocol (HTTPS), Secure Sockets Layer (SSL), Transport Layer Security (TLS), etc. Web browsers 308 may utilize facilities such as AJAX, DHTML, Adobe™ Flash, Javascript, Application Programming Interfaces (APIs), etc. In some embodiments, the computer system 300 may implement a mail server stored program component. The mail server may be an Internet mail server such as Microsoft Exchange, or the like. The mail server may utilize facilities such as ASP, ActiveX, ANSI C++/C#, Microsoft .NET, Common Gateway Interface (CGI) scripts, Java, JavaScript, PERL, PHP, Python, WebObjects, etc. The mail server may utilize communication protocols such as Internet Message Access Protocol (IMAP), Messaging Application Programming Interface (MAPI), Microsoft Exchange, Post Office Protocol (POP), Simple Mail Transfer Protocol (SMTP), or the like.

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

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

The illustrated steps are set out to explain the exemplary embodiments shown, and it should be anticipated that ongoing technological development will change the manner in which particular functions are performed. These examples are presented herein for purposes of illustration, and not limitation. Further, the boundaries of the functional building blocks have been arbitrarily defined herein for the convenience of the description. Alternative boundaries can be defined so long as the specified functions and relationships thereof are appropriately performed. Alternatives (including equivalents, extensions, variations, deviations, etc., of those described herein) will be apparent to persons skilled in the relevant art(s) based on the teachings contained herein. Such alternatives fall within the scope and spirit of the disclosed embodiments. Also,

the words "comprising," "having," "containing," and "including," and other similar forms are intended to be equivalent in meaning and be open ended in that an item or items following any one of these words is not meant to be an exhaustive listing of such item or items or meant to be limited to only the listed item or items. It must also be noted that as used herein, the singular forms "a," "an," and "the" include plural references unless the context clearly dictates otherwise.

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

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

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

ADVANTAGES OF THE PRESENT INVENTION:

In an embodiment, the solution proposed in the present disclosure for real-time settlement of card based transactions to enable instant payments to merchants enables:

1. To bring millions of small and untapped merchants under the card payment eco-system. This may uplift the small merchants and at the same time it may benefit the payment card eco-system players like issuers, acquirers and payment networks.

2. To implement and support the real time payments by acquirers for the small merchants, may stay ahead of their peers in the market in terms of brand value, revenue and merchant market share.

"Real time settlement of card transactions to enable instant payments to merchants"

ABSTRACT

The present invention provides a system and method for establishing an authorization process and real time settlement of card based payment transactions between an acquirer 113 and a seller 120 through an issuer 112 via payment networks 111. The acquirer 113 undergoes an authorization process for accepting card payments that involves sending an authorization request (114a, 114b, 114c) and receiving an authorization response (115a, 115b, 115c) for card transactions between the acquirer 113, the payment network 111, the issuer 112, and the seller 120, where the authorization response (115a, 115b, 115c) is an approval or decline of authorization for the seller 120 to perform card transactions based on confirmation on real time settlement. Once the card payment transaction is authorized by the issuer 112, the acquirer 113 involves verifying whether the seller 120 is enrolled for a real time settlement and if it is found that the seller 120 is enrolled for the real time settlement, the acquirer 113 pays the seller 120 instantly after deducting the interchange fee on real time. Thus, the required fund is transferred to the seller 120 in accordance with the real time basis. Hence, the method of establishing a low adoption rate of card based payment transactions that includes the authorization process and the real time settlement in accordance with some embodiments of the present invention are disclosed.
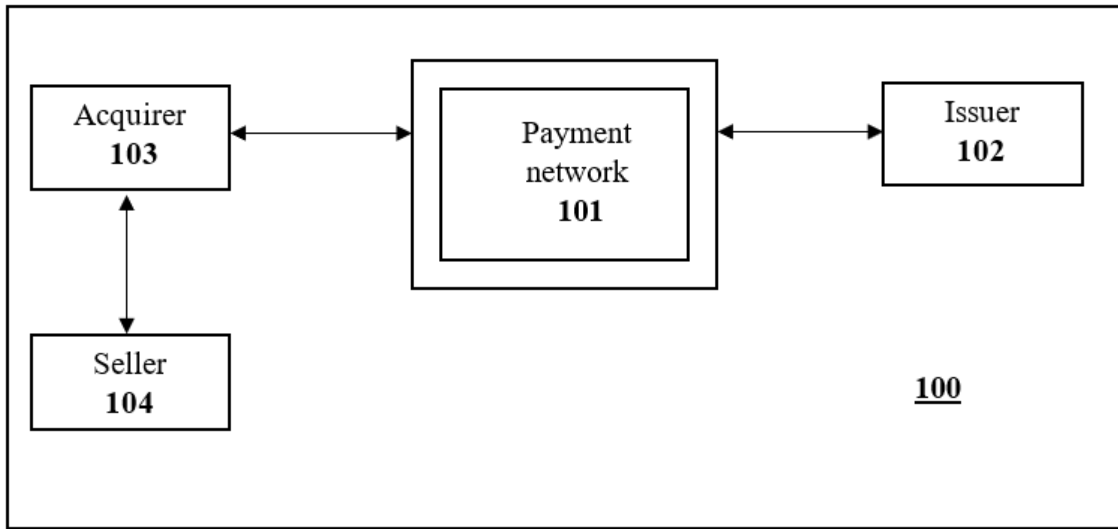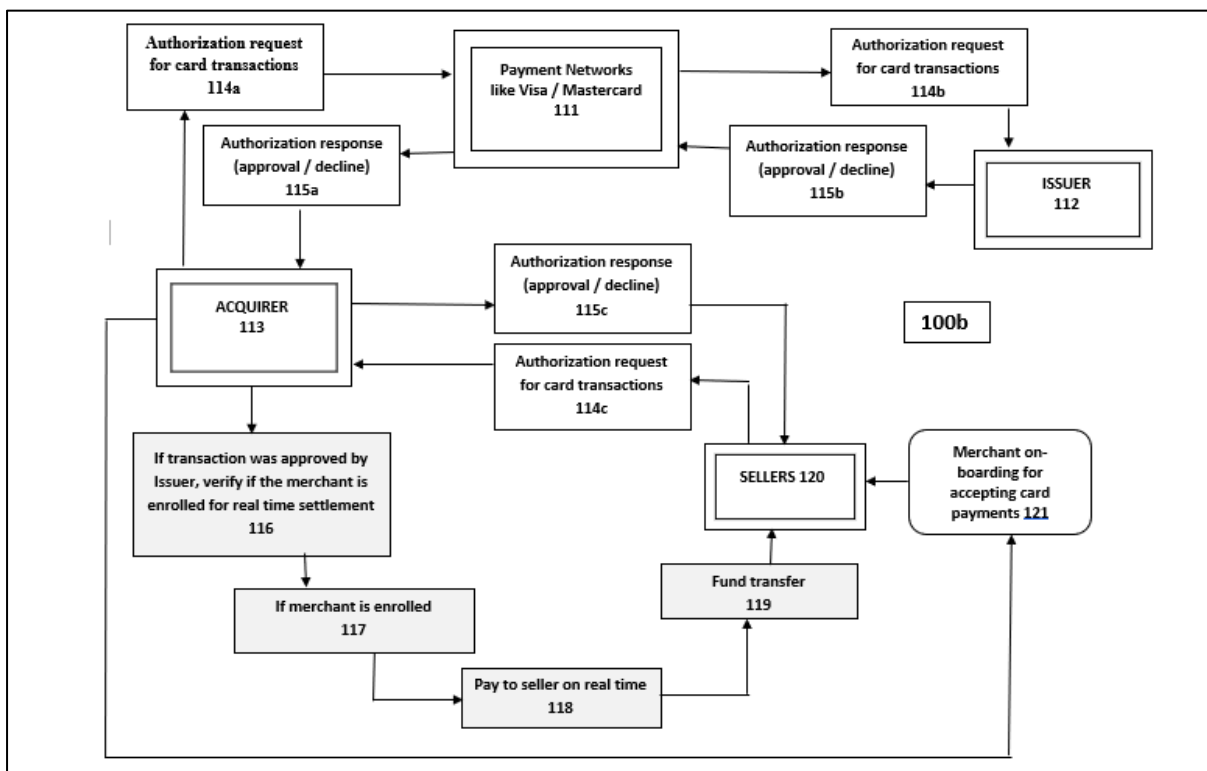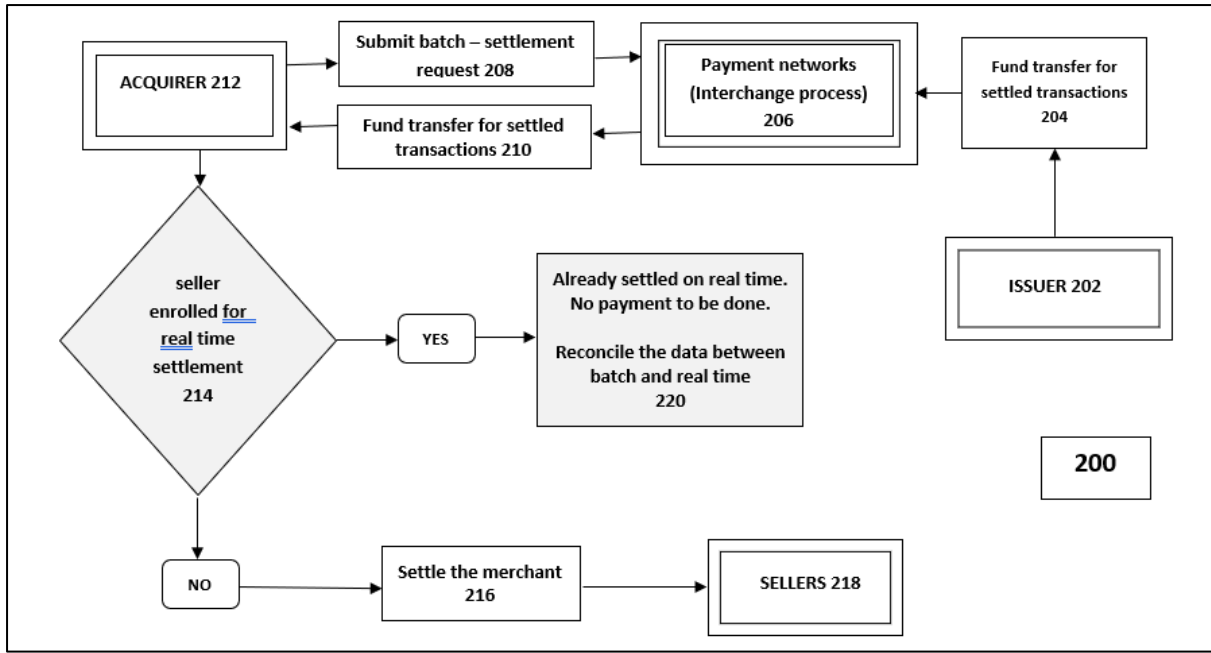
Fig. 1B

Fig. 1A

Fig. 1B

Fig. 2

Fig. 3