

Methods for determining parameters of an installment offer, payment devices, and payment servers

FIELD OF INVENTION

[1] The present invention relates broadly, but not exclusively, to methods for determining parameters of an installment offer, payment devices, and payment servers.

BACKGROUND

[2] Credit card holders commonly use their credit card to pay for their purchases towards the end of a pre-determined payment window (for example at or near a pre-determined day of each month, for example every first day of the month, or for example every 15th day of the month). Payment may not have to be made in full, but outstanding amounts may be carried over to the next month. Furthermore, there may be an option to convert the payment for their purchase into an installment with fixed rates over a pre-determined period of time.

[3] Purchase on installment is increasing rapidly in some of the markets like Europe, Asia-Pacific (APAC) and Latin America and the Caribbean (LAC). However, installment offering needs the cardholder and the issuer to agree before a transaction is processed as installment. Determination of the terms and conditions and agreement on the terms and conditions between the cardholder and the issuer may be cumbersome.

[4] A need therefore exists to provide devices, systems and methods to address the above problem.

SUMMARY

[5] According to a first aspect, there is provided a method for determining parameters of an installment offer. The method includes: capturing an image related to an item that a user wishes to purchase; determining geometric properties of the image; determining a creditability of the user in response to a request to a database; and determining at least one parameter of the installment offer for purchase of the item by the user based on the creditability of the user and based on the geometric properties of

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the image wherein the creditability of the user is dynamically updated based on the user's financial behavior, including information based on payment reversals and a bureau score.

[6] According to a second aspect, there is provided a payment device, the payment device including: at least one processor; at least one memory including computer program code; a communication port coupled to the processor; and a camera. The at least one memory and the computer program code are configured to, with the at least one processor, cause the at least one processor to: capture, using the camera, an image related to an item that a user wishes to purchase; determine geometric properties of the image; transmit, using the communication port, information based to the geometric properties; and receive, using the communication port, at least one parameter of an installment offer for purchase of the item in response to the transmitted information and based on a creditability of the user, wherein the at least one parameter of the installment offer is determined based on a creditability of the user, and wherein the creditability of the user is dynamically updated based on the user's financial behavior, including information based on payment reversals and a bureau score.

[7] According to a third aspect, there is provided a payment server including: at least one processor; at least one memory including computer program code; and a communication port coupled to the processor. The at least one memory and the computer program code are configured to, with the at least one processor, cause the at least one processor to: receive, using the communication port, information related to an item that a user wishes to purchase; determine a creditability of the user in response to a request to a database; and determining at least one parameter of the installment offer for purchase of the item by the user based on the creditability of the user and based on the information related to the item that the user wishes to purchase; wherein wherein the at least one memory and the computer program code are further configured to, with the at least one processor, cause the at least one processor to: update the creditability of the user based on the user's financial behavior, including information based on payment reversals and a bureau score.

BRIEF DESCRIPTION OF THE DRAWINGS

[8] Embodiments and implementations are provided by way of example only, and will be better understood and readily apparent to one of ordinary skill in the art from the following written description, read in conjunction with the drawings, in which:

[9] Figure 1 shows a payment infrastructure, in accordance with an embodiment of present disclosure;

[0010] Figure 2 shows a flow diagram illustrating a method for determining parameters of an installment offer, in accordance with an embodiment of present disclosure;

[0011] Figure 3 shows an illustration of dynamically moving users or identifiers associated with accounts or payment cards of the user, in accordance with an embodiment of present disclosure;

[0012] Figure 4A shows a diagram illustrating a flow of information for processing an installment transaction, in accordance with an embodiment of present disclosure;

[0013] Figure 4B shows a table related to a method for determining an installment offer based on customer financial behavior, in accordance with an embodiment of present disclosure;

[0014] Figure 5 shows a diagram illustrating a method for providing installment offers based on a QR code according to various embodiments, in accordance with an embodiment of present disclosure;

[0015] Figure 6 depicts an exemplary computing device that may be utilized to implement a server, in accordance with an embodiment of present disclosure; and

[0016] Figure 7 is a schematic of a computing device 700 that may be utilized to implement a mobile device, in accordance with an embodiment of present disclosure.

DETAILED DESCRIPTION

Overview

[0017] When a consumer wishes to purchase a product, not only the price of the product or service, but also options for paying for the purchase may be of interest to the user. For example, if an installment option is available (i.e. if the consumer may pay in several installments instead of paying the entire price of the product at once), the user may benefit from enhanced liquidity or may even make a purchase that he could not afford without installment options.

[0018] However, installment options may come at a risk for financial institutions providing such installment options, because the consumer may not be able to pay the installments in a timely manner or may entirely fail to pay the installments. As such, the banks may offer installments to different consumers with different terms and conditions. For example, a consumer with a good track history of paying back debts or installments may be offered a better interest rate than a consumer with a bad track history. For some consumers with a very bad track history, the financial institution may decide not to offer any installment option at all.

[0019] Furthermore, installment options offered to a consumer may also depend on the product or service. For example, installment options for a durable product may be offered at better interest rates than installment options for short-lived products or services.

[0020] In order to provide the necessary information to the financial institution for making a decision on whether to offer an installment option for a purchase, and, in case it is decided to offer an installment option for the purchase, under which terms and conditions the installment offer is to be offered, a consumer may advantageously use a camera 108 of his mobile device 106 (which may act as a payment device, and an exemplary structure of which is described with reference to Figure 7 below) to capture an image of a QR code 104 provided on or near a product 102 (or on or near a description of a service, in case the consumer would like to purchase a service instead of a product), like illustrated in Figure 1. The QR code may advantageously include information like name or type of the product or service, price, or any other information related to the product or service. The mobile device 106 may then transmit the information related to the QR code and information identifying the consumer to a payment network 112 (which may include a payment server, an exemplary structure of which is described with reference to Figure 6 below), like illustrated by arrow 114, via a suitable network, for example a mobile radio communication network, for example the Internet. The payment network 112 may then analyze the information received from the mobile device 106. For example, the payment network 112 may determine a creditability of the consumer, and may, based on the creditability and the information related to the QR code, determine one or more parameters of an installment offer (such as for example information whether an installment option is offered at all, or terms and conditions (for example interest rate, duration, and/ or monthly rate) of the installment offer), and may provide this information to the mobile device 106, like illustrated by arrow 116. The mobile device 106 may indicate these parameters to the consumer via a display 110, and the user may then decide whether to accept or decline the installment option.

Terms Description (in Addition to Plain and Dictionary Meaning of Terms)

[0021] As used herein, an installment offer may refer to an offer made by a bank or a payment card provider for making a payment not in full, but in (regular, for example monthly) installments. An interest may be charged for the installment, or the installment

may be provided without incurring any additional costs (for example for promoting sales or use of a specific payment mode).

[0022] An installment option may be provided under specific terms and conditions. The terms and conditions may include, for example, a specific interest rate like stated above, a one-time fee to be paid for the installment, and/ or a pre-determined period of time of the installment.

[0023] Creditability of a consumer (or user) may relate to how reliable a consumer is expected with respect to paying rates of the installment. The creditability may be determined (or estimated), and may be changed (or re-evaluated), based on the consumer's financial behavior (or user's financial behavior), which may for example include a spending pattern of the consumer, a track record of previous installments, information on late payments, information on payment reversals, a bureau score, or a CIBIL score.

[0024] Geometric properties may refer to shapes or colors in an image (or a printout of an image, that may then be captured by a camera) that may be used to encode information. The encoded information may be retrieved (in other words: decoded) from the image, and the decoded information is preferable invariant against translations, rotations, noise or any other perturbation that may occur when capturing an image of the geometric properties. Examples for geometric properties are QR codes and bar codes, and it will be understood that any other machine readable code may be used for encoding the information.

[0025] "Capturing" refers to scanning (for example using a scanner or a camera) or mere reading (for example reading data that has previously been scanned by the device from which is read or by another device, for example reading from a storage or memory).

Exemplary Embodiments

[0026] Embodiments will be described, by way of example only, with reference to the drawings. Like reference numerals and characters in the drawings refer to like elements or equivalents. It is the intent of present embodiments to present methods, payment devices, and payment servers that allow efficient processing of user specific installment offers, for example for determining whether (and if, under which terms and

conditions) an installment offer (in other words: an offer for an installment option) for paying a purchase is to be provided to a consumer.

[0027] Figure 2 shows a flow diagram 200 illustrating a method for determining parameters of an installment offer. A parameter of the installment may include an indicator indicating whether an issuer is willing to offer an installment to the user, terms and conditions under which the issuer would offer an installment to the user, a minimum number of installments of the installment, maximum number of installments of the installment, a fee for the installment, and/ or an interest rate for the installment.

[0028] In 202, a consumer may capture (for example with a camera of his mobile phone, which may also act as a payment device) an image related to an item (for example a product or a service) that a user wishes to purchase. The image may be an image of a QR code or bar code (or any other code suitable to encode information in it), and may be provided by the merchant at or near the item. The image may include encoded information. The encoded information may represent information on at least one of a name of the item, a product category of the item, a price of the item, a minimum number of installments of the installment, a maximum number of installments of the installment, a fee for the installment, an interest rate of the installment, or any other data related to the product (or service) or an installment associated with a purchase of the product.

[0029] In step 204, geometric properties of the image may be determined, for example on the mobile phone of the user. For example, the QR code or bar code may be analyzed, and the information encoded into the QR code or bar code may be decoded. The analysis and the decoding may be carried out on the device used by the consumer (for example his mobile phone, for example the analysis and the decoding may be carried out by a QR code analysis module 534 provided in a digital wallet 508, like illustrated in Figure 5 and described in more detail below). In another example, the analysis and the decoding may be carried out on a server, for example a server of a payment network; in such case, the server may include a QR code analysis module. If the analysis is carried out on the device of the user, the decoded information may be forwarded to the payment network. If the analysis is to be carried out in the payment network, the captured image may be forwarded to the payment network. Furthermore, an identifier of the user (for example his personal identification card number, or his social security number, or his bank account number, or his payment card number, for example primary account number) may be forwarded to the payment network, for example together with the decoded information or the image. The payment network (for

example a payment server provided in the payment network) may also receive information related to an item that a user wishes to purchase.

[0030] In step 206, advantageously, a creditability of the user may be determined (for example by a payment server, which may for example be provided in the payment network 112 illustrated in Figure 1), in response to a request to a database. For example, the payment network may have a database in which creditability information is stored for each of a financial institution's clients (for example payment card holders). Based on the identifier of the user provided from the device of the user, the user's creditability may be requested from the database.

[0031] In step 208, at least one parameter of the installment offer for purchase of the item by the user may be determined, for example by the payment network (for example the payment server) or the bank issuing the user's payment card, based on the creditability of the user and based on the geometric properties of the image (for example based on the decoded information derived from the geometric properties of the image).

[0032] Determining the at least one parameter of the installment offer for purchase of the item by the user may advantageously include comparing terms and conditions related to the geometric properties with terms and conditions provided by an issuer. For example, a code (for example QR code) may encode (and thus define) certain terms and conditions that would be acceptable for the purchase of the product or service, and these acceptable terms and conditions may then be compared with terms and conditions that are based on the creditability of the user, so that an installment option may be provided if the terms and conditions for which the user would be eligible are in line with the acceptable terms and conditions. For example, the QR code may impose a minimum installment term of 12 months, and if the user (for example based on his creditability) is eligible only for an installment with at most 6 months, no installment option may be offered to the user, while if the user is eligible for installments of any one of 6, 9, 12, or 24 months, installment options of 12 or 24 months may be offered to the user.

[0033] By taking into account both the user's creditability and the information related to the product, advantageously a well-grounded decision can be made as to under which terms and conditions to offer an installment option. This may advantageously reduce the bank's risk (or compensate the bank's risk by an increased interest rate), while at the same time providing an offer to the user that is still attractive.

[0034] Information on the at least one parameter of the installment offer may be received by the user's mobile phone in response to the transmitted information based on the geometric properties, and based on a creditability of the user. The information may then be displayed to the user, for example on a display of the user's mobile phone, and the user may then decide whether to make use of the installment option or not. Payment may then either be effected by the user's mobile phone (which may then act as a payment device), for example via a digital wallet of the user, or the user may proceed to a payment terminal, for example at the merchants point of sale, and may already be aware of the installment option that he has for making the purchase.

[0035] The creditability of the user may change over time. For example, a user may change his financial behavior, which may lead to the creditability improving or degrading. As such, the creditability of the user may be dynamically updated, for example based on the user's financial behavior. The user's financial behavior may include at least one of a spending pattern of the user, a track record of previous installments, information on late payments, information on payment reversals, a bureau score, or a CIBIL score.

[0036] Like illustrated in Figures 1 and 2, devices and methods may be provided for dynamic installment offers based on a cardholder (CH) financial behavior (in other words: for providing dynamic installment offers to a cardholder), for example at the point of sale, for example based on a financial behavior of the cardholder.

[0037] Figure 3 shows an illustration 300 of dynamically moving users or identifiers associated with accounts or payment cards of the user, for example primary account numbers (PANs) between different installment configurations. Such a configuration may be referred to as a dynamic installment configuration. The issuer bank 302 may define a plurality of PAN lists 304, 306, 308, 310. Each of the PAN lists 304, 306, 308, 310 may be associated with a respective configuration. For example, the first PAN list 304 may be associated with a first configuration 312, the second PAN list 306 may be associated with a second configuration 314, the third PAN list 308 may be associated with a third configuration 316, and the fourth PAN list 310 may be associated with a fourth configuration 318. Each configuration 312, 314, 316, 318 may include information on the tenure, and/ or fee, and/ or interest, and/ or creditability (for example a Bureau score range), like indicated by an example configuration 320. Arrows 322, 324, and 324 indicate that the PANs included in the PAN lists 304, 306, 308, 310, may be moved from one PAN list to another PAN list (which may result in the installment

configuration for the PAN which is moved being changed to the installment configuration of the PAN list to which the PAN is moved).

[0038] Like illustrated in Figure 3, the issuer (for example issuer bank 302) may define PAN specific lists, and may assign an installment configuration to each list. The issuer may then dynamically move PANs from one list to the other, for example based on CH (cardholder) performance.

[0039] After the issuer defined the PAN lists, the issuer may send to a payment network, for example a payment network operated by a credit card company (for example Mastercard®), an API (application programming interface) to populate the PAN list. The issuer may define the installment configurations (for example term of loan, interest rate, fee, other parameters like rounding, delinquency level, and/ or Bureau score range). The issuer may define a table which may be used as an algorithm to shift a PAN from one list to the other. The issuer may regularly (for example daily) send an updated API which may contain PAN, Bureau Score, Delinquency level of accounts and VIP (very important person) indicator. The daily updated API may evaluate which PAN list an input PAN should fall into. If there is a change, the credit card company may send a response back informing the issuer of the change. Since the PAN may be moved from one list to the other, the CH may get revised offers depending upon if his or her financial behavior has improved or become worse.

[0040] It will be understood that a similar method like described with reference to Figure 3 with respect to installment configurations may also be used for user's creditability. In other words, a user's creditability may either be stored in a table where each user is associated with a respective creditability, or there may be lists identifying users (for example lists of PANs) that all have the same creditability, and users (or PANs) may be shifted between those lists like described with reference to Figure 3.

[0041] Figure 4 shows a diagram 400 illustrating a flow of information for processing an installment transaction according to various embodiments. The cardholder (CH) may use his card at a POS terminal 402. In 416, an AUTH (authorization) request may reach the acquirer server 404 (for example at an acquiring bank).

[0042] The acquirer server 404 generally is associated with an acquirer who may be an entity (e.g. a company or organization) which issues (e.g. establishes, manages, administers) a transaction credential or an account (e.g. a financial bank account) of

the merchant. Examples of the acquirer include a bank and/or other financial institution. The acquirer server 104 may include one or more computing devices that are used to establish communication with another server by exchanging messages with and/or passing information to the other server.

[0043] In 418, the acquirer server 404 may send the request (in other words: may forward the AUTH request) to a payment network server 406 (for example a server in the payment network of Mastercard®). In 420, the payment network server 406 may send the request (in other words: may forward the AUTH request) to an installment application (for example at a credit card installment payment services 410) for check of eligibility. The installment application may check the installment parameters set up by the issuer one by one. In 424, customized CH offers may be read from a credit card installment UI (user interface) 412, for example the Mastercard® installment UI, and may then be sent to an issuer server 408 (for example at an issuer bank).

[0044] The issuer server 408 generally is associated with an issuer and may include one or more computing devices that are used to perform a payment transaction. The issuer may be an entity (e.g. a company or organization) which issues (e.g. establishes, manages, administers) a transaction credential or an account (e.g. a financial bank account).

[0045] In 426, customized offers may be sent to a credit card AUTH application. In 428, the payment network server 406 may send the customized offers to the issuer server 408 in the auth message. In 430, the issuer server 408 may approve (for example using an AUTH message) and may send approval to the payment network server 406. In 432, the payment network server 406 may send an approval (for example using an AUTH message) to the acquirer server 404. In 434, the acquirer server 404 may send approval to the merchant terminal (in other words: to the POS terminal 402).

[0046] Like illustrated by dotted lines 440, the payment network server 406, the credit card installment payment services, and the credit card installment UI 412 may be provided in the payment network 440. It will be understood that while illustrated as separate entities in Figure 4, the credit card installment payment services and the credit card installment UI 412 may be included in the payment network server 406 in some embodiments.

[0047] In 436, the issuer server 408 may subscribe for a credit card installment information for providing customized offers. In 438, information interchange of a daily update API between the issuer server 408 and the credit card installment UI 412 are illustrated in Figure 4B.

[0048] Figure 4B shows a table 442 related to a method for determining (and modifying, if the financial behavior of a user changes) the installment offer based on customer financial behavior (for example payments made and bureau scoring). In case of a change of user financial behavior, according to various embodiments, the issuer may send an API to the credit card company with all encrypted PAN for which they get modified bureau scores, late payments, payment reversals etc. The credit card company may run a program to scan through the parameters set by issuer on the UI, may find the existing configuration list for the PAN and may check if the PAN stays in the present list or moves to a different list. The credit card company may shift the installment configuration of the PAN and may respond back to issuer with success. After this change, the CH may be offered installment based on his modified configuration.

[0049] For example, configuration 1 may be most favorable to the CH (for example installments may have a long term, and/ or a low interest rate, and/ or no fee), and configuration 16 may be worst from a CH point of view (with high APR (annual percentage rate), and/ or short term, and/ or high fee, and/ or high interest rate), and configuration 17 may be a special VIP rate (for example with no fee and/ or no interest).

[0050] According to various embodiments, the offer may be changed based on a customer's financial behavior. According to various embodiments, dynamic Installment offers may be provided based on CH financial behavior. The installment offer may for example be determined or adjusted based on the cardholder financial behavior at the point of transactions.

[0051] According to various embodiments, an increased flexibility on QR based transactions may be provided.

[0052] Figure 5 shows a diagram 500 illustrating a method for providing installment offers based on a QR code according to various embodiments. As a prerequisite, in 530, the issuer 514 may subscribe for the credit card installment information and may set up customized offers.

[0053] In 516, a merchant 502 may generate a QR code (for example using a QR code generator 504) encoding information, for example including information related to the product or to the Installment. It will be understood that although a QR code is used as an example with reference to Figure 5, any other code that may be optically detected, may be provided instead, for example a bar code. In 518, the merchant 502 may stick the QR code onto (or place the QR code near) the product that he specifically wants to offer installment on (and may thus now have a product with QR code 506). In 520, the CH may log onto his mobile payment APP. The mobile APP may for example be a digital wallet 508, for example Masterpass®, and may be provided for example on the CH's mobile phone which may act as a payment device. The digital wallet 508 may include an image capture module 532, which may allow the CH, using the camera of his mobile phone, to capture (or scan) the QR code from the product with QR code 506. This capturing may for example include taking a photo (or loading a photo from a storage of the mobile phone, wherein the photo has previously been taken using the mobile phone, or has been received via a communication network (for example the internet) from another device). The digital wallet 508 may further include a QR code analysis module 534, which may analyze the captured QR code (for example the geometric properties of the squares of the QR code) and may thus extract (in other words: decode) information required for obtaining information on available installment offers. In 522, the cardholder's digital wallet 508 may call a server with credit card installment payment services 510 (for example a Mastercard® API) to check for eligibility of all cards in the digital wallet 508. Furthermore, the information related to the product or that Installment terms encoded in the QR code may be read. In 524, the credit card installment application may check the installment parameters set up by an issuer 514, for example may check the parameters one by one, for example may check from a credit card installment UI 512. For example, an installment parameter administration module 540 is provided, which allows an issuer to provide information on available installments and conditions, under which these installments are available. In 526, customized CH offers (in other words: offers, for example installment offers, which are customized to the CH) may be read from the credit card installment UI 512, for example by an installment parameter extraction module 538. It will be understood that, like illustrated by dotted lines 440 in Figure 4, the credit card installment payment services 510 (and as such also the installment parameter extraction module 538), and the credit card installment UI 512 (and as such also the installment parameter administration module 540) may be part of the payment network. In an alternative example, the credit card installment UI 512 (and as such also the installment parameter

administration module 540) may be provided in a server (or network) of the issuer 514, and since there may be more than one issuer, each issuer may have a dedicated credit card installment UI 512 (and as such also the installment parameter administration module 540); in such a case, the installment parameter extraction module 538 is configured to extract (or collect) the various installment parameters from the various issuers, via the respective installment parameter administration modules 540.

[0054] According to various embodiments, the installment offer may only be read if any or all of the cards offer installments for the term and the fee offered by merchant 502 on the QR code. In 528, a response may be delivered to the digital wallet 508 (in other words: to CH mobile payment app). An installment offer module 536 of the digital wallet 508 may notify the CH of available payment options (for example including installment options). As such, the CH may look at the various payment options provided by the cards in his wallet. He may be able to see details like payment terms, interest, fees and period before deciding what card to choose to make the payment.

[0055] The QR code may encode information which can be used to evaluate whether an installment offer is to be made to a cardholder or not. According to various embodiments, the QR code may include at least one of the following information: price of the product, a minimum number of installments, a maximum number of installments, a fee of the installment, or an interest rate of the installment.

[0056] According to various embodiments, the information stored (or encoded) in the QR code may be used to compare against the information that an issuer provides (for example information that the issuer enter with the credit card installment UI). According to various embodiments, the system may compare the fee requested by the merchant and the fee requested by the issuer. If the fee requested by the merchant (i.e. the fee encoded in the QR code) is higher than the fee requested by the issuer (for example the fee entered by the issuer into the credit card installment UI), this tells the issuer that the cardholder may pay the issuer as well as that the card holder is ready to pay something additional to the merchant to buy the product on installments. Likewise, according to various embodiments, the system may determine whether the period of installments being offered by the merchant (i.e. the period of installments, for example the minimum number of installments and/ or the maximum number of installments, encoded into the QR code) is in the range allowed by the issuer (for example the period entered by the issuer into the credit card installment UI), and only if the period offered (or required) by the merchant is within the period offered by the issuer, and instalment offer will be provided to the card holder.

[0057] With the merchant installment offers (for example dynamic installment offers at the point of sale) using QR code according to various embodiments, the shopper may walk in a store, scan a product and see what the installment offers on his wallet cards are, without even going to the transaction terminal. This may furthermore provide the merchant an opportunity to have on the fly offers on the products and gain margins by having some additional fee for offering installments.

[0058] According to various embodiments, device, systems and methods may be provided for providing installment offers to a consumer, and the clearing system may then proceed based on the provided installment offer.

[0059] With a pressure on Interchange rates, issuers are looking for flexible payment offers to the cardholder for encouraging the usage of their product. Integration of QR based payments with the installment offers may provide real time agreement on installment by both cardholder and issuer. Integration of QR based payments with the installment offers may also provide customized offers being provided to the cardholder during the purchase. Integration of QR based payments with interoperable QR like BHARAT QR may also result in Mastercard® installment offers being extended to other scheme transactions.

[0060] Figure 6 depicts an exemplary computing device 600, hereinafter interchangeably referred to as a computer system 600 or as a server 600, where one or more such computing devices 600 may be used to implement the payment server, which may for example be provided in the payment network 112 shown in Figure 1. The following description of the computing device 600 is provided by way of example only and is not intended to be limiting.

[0061] As shown in Figure 6, the example computing device 600 includes a processor 604 for executing software routines. Although a single processor is shown for the sake of clarity, the computing device 600 may also include a multi-processor system. The processor 604 is connected to a communication infrastructure 606 for communication with other components of the computing device 600. The communication infrastructure 606 may include, for example, a communications bus, cross-bar, or network.

[0062] The computing device 600 further includes a main memory 608, such as a random access memory (RAM), and a secondary memory 610. The secondary memory 610 may include, for example, a storage drive 612, which may be a hard disk drive, a solid state drive or a hybrid drive and/or a removable storage drive 614, which

may include a magnetic tape drive, an optical disk drive, a solid state storage drive (such as a USB flash drive, a flash memory device, a solid state drive or a memory card), or the like. The removable storage drive 614 reads from and/or writes to a removable storage medium 644 in a well-known manner. The removable storage medium 644 may include magnetic tape, optical disk, non-volatile memory storage medium, or the like, which is read by and written to by removable storage drive 614. As will be appreciated by persons skilled in the relevant art(s), the removable storage medium 644 includes a computer readable storage medium having stored therein computer executable program code instructions and/or data.

[0063] In an alternative implementation, the secondary memory 610 may additionally or alternatively include other similar means for allowing computer programs or other instructions to be loaded into the computing device 600. Such means can include, for example, a removable storage unit 622 and an interface 650. Examples of a removable storage unit 622 and interface 650 include a program cartridge and cartridge interface (such as that found in video game console devices), a removable memory chip (such as an EPROM or PROM) and associated socket, a removable solid state storage drive (such as a USB flash drive, a flash memory device, a solid state drive or a memory card), and other removable storage units 622 and interfaces 650 which allow software and data to be transferred from the removable storage unit 622 to the computer system 600.

[0064] The computing device 600 also includes at least one communication interface 624 (in other words: a communication port). The communication interface 624 allows software and data to be transferred between computing device 600 and external devices via a communication path 626. In various embodiments of the inventions, the communication interface 624 permits data to be transferred between the computing device 600 and a data communication network, such as a public data or private data communication network. The communication interface 624 may be used to exchange data between different computing devices 600 which such computing devices 600 form part an interconnected computer network. Examples of a communication interface 624 can include a modem, a network interface (such as an Ethernet card), a communication port (such as a serial, parallel, printer, GPIB, IEEE 1394, RJ45, USB), an antenna with associated circuitry and the like. The communication interface 624 may be wired or may be wireless. Software and data transferred via the communication interface 624 are in the form of signals which can be electronic, electromagnetic, optical or other signals capable of being received by communication interface 624.

These signals are provided to the communication interface via the communication path 626.

[0065] As shown in Figure 6, the computing device 600 further includes a display interface 602 which performs operations for rendering images to an associated display 630 and an audio interface 632 for performing operations for playing audio content via associated speaker(s) 634.

[0066] As used herein, the term "computer program product" (or computer readable medium, which may be a non-transitory computer readable medium) may refer, in part, to removable storage medium 644, removable storage unit 622, a hard disk installed in storage drive 612, or a carrier wave carrying software over communication path 626 (wireless link or cable) to communication interface 624. Computer readable storage media (or computer readable media) refers to any non-transitory, non-volatile tangible storage medium that provides recorded instructions and/or data to the computing device 600 for execution and/or processing. Examples of such storage media include magnetic tape, CD-ROM, DVD, Blu-ray™ Disc, a hard disk drive, a ROM or integrated circuit, a solid state storage drive (such as a USB flash drive, a flash memory device, a solid state drive or a memory card), a hybrid drive, a magneto-optical disk, or a computer readable card such as a PCMCIA card and the like, whether or not such devices are internal or external of the computing device 600. Examples of transitory or non-tangible computer readable transmission media that may also participate in the provision of software, application programs, instructions and/or data to the computing device 600 include radio or infra-red transmission channels as well as a network connection to another computer or networked device, and the Internet or Intranets including e-mail transmissions and information recorded on Websites and the like.

[0067] The computer programs (also called computer program code) are stored in main memory 608 and/or secondary memory 610. Computer programs can also be received via the communication interface 624. Such computer programs, when executed, enable the computing device 600 to perform one or more features of embodiments discussed herein. In various embodiments, the computer programs, when executed, enable the processor 604 to perform features of the above-described embodiments. Accordingly, such computer programs represent controllers of the computer system 600.

[0068] Software may be stored in a computer program product and loaded into the computing device 600 using the removable storage drive 614, the storage drive 612, or

the interface 650. The computer program product may be a non-transitory computer readable medium. Alternatively, the computer program product may be downloaded to the computer system 600 over the communications path 626. The software, when executed by the processor 604, causes the computing device 600 to perform functions of embodiments described herein.

[0069] It is to be understood that the embodiment of Figure 6 is presented merely by way of example. Therefore, in some embodiments one or more features of the computing device 600 may be omitted. Also, in some embodiments, one or more features of the computing device 600 may be combined together. Additionally, in some embodiments, one or more features of the computing device 600 may be split into one or more component parts. The main memory 608 and/or the secondary memory 610 may serve(s) as the memory for the payment server, which may for example be provided in the payment network 112 shown in Figure 1.; while the processor 604 may serve as the processor of the payment server, which may for example be provided in the payment network 112 shown in Figure 1. .

[0070] Figure 7 is a schematic of a computing device 700 that may be utilized to implement the mobile phone 106 (which may for example act as a payment device) shown in Figure 1. The computing device 700 comprises a keypad 702, a display 704, a speaker 708 and an antenna 710. Communication hardware that is used to enable NFC communication with the merchant device 102 is represented by RF processor 712 which provides an RF signal to the antenna 710 for the transmission of data signals, and the receipt thereof. Additionally provided is a baseband processor 714, which provides signals to and receives signals from the RF Processor 712.

[0071] The keypad 702 and the display 704 are controlled by an application processor 718. The display 704 is used to provide an indication to the user (in other words: consumer or customer), for example an indication of available installment options. A power and audio controller 720 is provided to supply power to the RF processor 712 and the baseband processor 714, the application processor 718, and other hardware. The power and audio controller 720 also controls audio output via the speaker 708.

[0072] Also provided is a camera 736 which may capture images (in other words: take photos). The camera 736 may be controlled by the application processor 718. The captures images may include representation of geometric shapes (for example of boxes or bars), and the application processor 718 may analyze the geometric shapes and may decode information that is encoded by the geometric shapes.

[0073] In order for the application processor 718 to operate, various different types of memory are provided. Firstly, the computing device 700 includes Random Access Memory (RAM) 726 connected to the application processor 718 into which data and program code can be written and read from at will. Code placed anywhere in RAM 726 can be executed by the application processor 718 from the RAM 726. RAM 726 represents a volatile memory of the computing device 700.

[0074] Secondly, the computing device 700 is provided with a long-term storage 728 connected to the application processor 718. The long-term storage 728 comprises three partitions, an operating system (OS) partition 730, a system partition 732 and a user partition 734. The long-term storage 728 represents a non-volatile memory of the computing device 700.

[0075] In the present example, the OS partition 730 contains the firmware of the computing device 700 which includes an operating system. Other computer programs may also be stored on the long-term storage 728, such as application programs, and the like. In particular, application programs which are mandatory to the computing device 700 are typically stored in the system partition 732. The application programs stored on the system partition 732 would typically be those which are bundled with the computing device 700 by the device manufacturer when the computing device 700 is first sold. Application programs which are added to the computing device 700 by the user would usually be stored in the user partition 734. For example, the user partition 734 may store instructions, which, when executed, make the computing device 700 execute functions of embodiments described herein.

[0076] Some portions of the description herein are explicitly or implicitly presented in terms of algorithms and functional or symbolic representations of operations on data within a computer memory. These algorithmic descriptions and functional or symbolic representations are the means used by those skilled in the data processing arts to convey most effectively the substance of their work to others skilled in the art. An algorithm is here, and generally, conceived to be a self-consistent sequence of steps leading to a desired result. The steps are those requiring physical manipulations of physical quantities, such as electrical, magnetic or optical signals capable of being stored, transferred, combined, compared, and otherwise manipulated.

[0077] Unless specifically stated otherwise, and as apparent from the description herein, it will be appreciated that throughout the present specification, discussions

utilizing terms such as “receiving”, “scanning”, “capturing”, “calculating”, “determining”, “replacing”, “generating”, “initializing”, “outputting”, or the like, refer to the action and processes of a computer system, or similar electronic device, that manipulates and transforms data represented as physical quantities within the computer system into other data similarly represented as physical quantities within the computer system or other information storage, transmission or display devices.

[0078] The present specification also discloses apparatus for performing the operations of the methods. Such apparatus may be specially constructed for the required purposes, or may comprise a computer or other device selectively activated or reconfigured by a computer program stored in the computer. The algorithms and displays presented herein are not inherently related to any particular computer or other apparatus. Various machines may be used with programs in accordance with the teachings herein. Alternatively, the construction of more specialized apparatus to perform the required method steps may be appropriate. The structure of a computer suitable for executing the various methods / processes described herein will appear from the description herein.

[0079] In addition, the present specification also implicitly discloses a computer program, in that it would be apparent to the person skilled in the art that the individual steps of the method described herein may be put into effect by computer code. The computer program is not intended to be limited to any particular programming language and implementation thereof. It will be appreciated that a variety of programming languages and coding thereof may be used to implement the teachings of the disclosure contained herein. Moreover, the computer program is not intended to be limited to any particular control flow. There are many other variants of the computer program, which can use different control flows without departing from the spirit or scope of the invention.

[0080] Furthermore, one or more of the steps of the computer program may be performed in parallel rather than sequentially. Such a computer program may be stored on any computer readable medium. The computer readable medium may include storage devices such as magnetic or optical disks, memory chips, or other storage devices suitable for interfacing with a computer. The computer readable medium may also include a hard-wired medium such as exemplified in the Internet system, or wireless medium such as exemplified in the GSM mobile telephone system. The

computer program when loaded and executed on such a computer effectively results in an apparatus that implements the steps of the preferred method.

[0081] According to various embodiments, a "circuit" may be understood as any kind of a logic implementing entity, which may be special purpose circuitry or a processor executing software stored in a memory, firmware, or any combination thereof. Thus, in an embodiment, a "circuit" may be a hard-wired logic circuit or a programmable logic circuit such as a programmable processor, e.g. a microprocessor (e.g. a Complex Instruction Set Computer (CISC) processor or a Reduced Instruction Set Computer (RISC) processor). A "circuit" may also be a processor executing software, e.g. any kind of computer program, e.g. a computer program using a virtual machine code such as e.g. Java. Any other kind of implementation of the respective functions which will be described in more detail below may also be understood as a "circuit" in accordance with an alternative embodiment.

[0082] It will be understood that functionality of one or more circuits may be combined in a single circuit or split up into several circuits.

[0083] Various features are described for a device, but may analogously also be provided for a method, and vice versa.

[0084] According to various embodiments, merchant Installment offers using QR code (in other words: merchant offers on installments using QR-Code) may be provided.

[0085] According to various embodiments, a method for determining parameters of an installment offer may be provided. The method may include: determining information related to an item that a user wishes to purchase; determining a creditability of the user; and determining the parameters of the installment offer for purchase of the item by the user based on the creditability of the user.

[0086] According to various embodiments, a method for determining parameters of an installment offer may be provided. The method may include: determining an image related to an item that a user wishes to purchase; determining geometric properties of the image; and determining the parameters of the installment offer for purchase of the item by the user based on the geometric properties.

[0087] Thus, it can be seen that devices and methods have been provided to overcome the problems of cumbersome determination of the terms and conditions and

agreement on the terms and conditions between the cardholder and the issuer, for example by providing a method for determining parameters of an installment offer, a payment device, and a payment server. Such a method may advantageously include: capturing an image related to an item that a user wishes to purchase; determining geometric properties of the image; determining a creditability of the user in response to a request to a database; and determining at least one parameter of the installment offer for purchase of the item by the user based on the creditability of the user and based on the geometric properties. Such a payment device may include: at least one processor; at least one memory including computer program code; a communication port coupled to the processor; and a camera; where the at least one memory and the computer program code configured to, with the at least one processor, cause the at least one processor to advantageously: capture, using the camera, an image related to an item that a user wishes to purchase; determine geometric properties of the image; transmit, using the communication port, information based to the geometric properties; and receive, using the communication port, at least one parameter of an installment offer for purchase of the item in response to the transmitted information and based on a creditability of the user. Such a payment server may include: at least one processor; at least one memory including computer program code; and a communication port coupled to the processor; wherein the at least one memory and the computer program code configured to, with the at least one processor, cause the at least one processor to advantageously: receive, using the communication port, information related to an item that a user wishes to purchase; determine a creditability of the user in response to a request to a database; and determine at least one parameter of the installment offer for purchase of the item by the user based on the creditability of the user and based on the information related to the item that the user wishes to purchase.

[0088] At least one parameter of the installment offer for purchase of the item by the user may advantageously be determined based on the creditability of the user and based on the geometric properties. This may allow to provide installment offers tailored to the circumstances; for example, reliable users may benefit from better terms and conditions, while less reliable users may either not be offered an installment option at all, or may be offered an installment option at less preferred terms and conditions (in order to compensate for the financial institution's risk).

[0089] The image may advantageously include encoded information, and the encoded information may representing information on at least one of a name of the item, a

product category of the item, a price of the item, a minimum number of installments of the installment, a maximum number of installments of the installment, a fee for the installment, or an interest rate of the installment. This may simplify the information interchange, since various information may be combined into one image.

[0090] The creditability of the user may advantageously be dynamically updated based on the user's financial behavior. This may allow for decisions on the installment options to be based on latest data, for example in cases where a previously reliable user becomes less reliable, or a previously unreliable user improves his track record and thus is considered to have improved his reliability.

[0091] Determining the at least one parameter of the installment offer for purchase of the item by the user may advantageously include comparing terms and conditions related to the geometric properties with terms and conditions provided by an issuer. This may make sure that the installment option that is offered is in line with installment parameters that are suggested at the merchant side (and that are encoded into the geometric properties).

[0092] It will be appreciated by a person skilled in the art that numerous variations and/or modifications may be made to the present invention as shown in the specific embodiments without departing from the spirit or scope of the invention as broadly described. The present embodiments are, therefore, to be considered in all respects to be illustrative and not restrictive.

CLAIMS

1. A method for determining parameters of an installment offer, the method comprising:
capturing an image related to an item that a user wishes to purchase;
determining geometric properties of the image;
determining a creditability of the user in response to a request to a database;
and
determining at least one parameter of the installment offer for purchase of the item by the user based on the creditability of the user and based on the geometric properties of the image, wherein the creditability of the user is dynamically updated based on the user's financial behavior, including information based on payment reversals and a bureau score.
2. The method of claim 1,
wherein the image comprises at least one of a QR code or a bar code.
3. The method of any one of claims 1 to 2,
wherein the image comprises encoded information, the encoded information representing information on at least one of a name of the item, a product category of the item, a price of the item, a minimum number of installments of the installment, a maximum number of installments of the installment, a fee for the installment, or an interest rate of the installment.
4. The method of claim 1,
wherein the user's financial behavior comprises at least one of a spending pattern of the user, a track record of previous installments, information on late payments, information on payment reversals, a bureau score, or a CIBIL score.
5. The method of any one of claims 1 to 4,
wherein the at least one parameter of the installment comprises at least one of terms and conditions under which the issuer would offer an installment to the user, an indicator indicating whether an issuer is willing to offer an installment to the user, a minimum number of installments of the installment, maximum number of installments of the installment, a fee for the installment, or an interest rate for the installment.
6. The method of any one of claims 1 to 5,

wherein determining the at least one parameter of the installment offer for purchase of the item by the user comprises comparing terms and conditions related to the geometric properties with terms and conditions provided by an issuer.

7. A payment device comprising:
 - at least one processor;
 - at least one memory including computer program code;
 - a communication port coupled to the processor; and
 - a camera;
 the at least one memory and the computer program code configured to, with the at least one processor, cause the at least one processor to:
 - capture, using the camera, an image related to an item that a user wishes to purchase;
 - determine geometric properties of the image;
 - transmit, using the communication port, information based to the geometric properties; and
 - receive, using the communication port, at least one parameter of an installment offer for purchase of the item in response to the transmitted information and based on a creditability of the user, wherein the at least one parameter of the installment offer is determined based on a creditability of the user, and wherein the creditability of the user is dynamically updated based on the user's financial behavior, including information based on payment reversals and a bureau score.
8. The payment device of claim 7,
 - wherein the image comprises at least one of a QR code or a bar code.
9. The payment device of any one of claims 7 to 8,
 - wherein the image comprises encoded information, the encoded information representing information on at least one of a name of the item, a product category of the item, a price of the item, a minimum number of installments of the installment, a maximum number of installments of the installment, a fee for the installment, or an interest rate of the installment.
10. The payment device of claim 7,
 - wherein the user's financial behavior comprises at least one of a spending pattern of the user, a track record of previous installments, information on late payments, information on payment reversals, a bureau score, or a CIBIL score.

11. The payment device of any one of claims 7 to 10,
wherein the at least one parameter of the installment comprises terms and conditions under which the issuer would offer an installment to the user.
12. The payment device of claim 11,
wherein the at least one parameter comprises an indicator indicating whether an issuer is willing to offer an installment to the user.
13. The payment device of any one of claims 7 to 12,
wherein the at least one parameter comprises at least one of a minimum number of installments of the installment, maximum number of installments of the installment, a fee for the installment, or an interest rate for the installment.
14. A payment server comprising:
at least one processor;
at least one memory including computer program code; and
a communication port coupled to the processor;
the at least one memory and the computer program code configured to, with the at least one processor, cause the at least one processor to:
receive, using the communication port, information related to an item that a user wishes to purchase;
determine a creditability of the user in response to a request to a database;
and
determine at least one parameter of the installment offer for purchase of the item by the user based on the creditability of the user and based on the information related to the item that the user wishes to purchase;
wherein the at least one memory and the computer program code are further configured to, with the at least one processor, cause the at least one processor to:
update the creditability of the user based on the user's financial behavior, including information based on payment reversals and a bureau score.
15. The payment server of claim 14,
wherein the user's financial behavior comprises at least one of a spending pattern of the user, a track record of previous installments, information on late payments, information on payment reversals, a bureau score, or a CIBIL score.
15. The payment server of any one of claims 14 to 15,
wherein determining the at least one parameter of the installment offer for purchase of the item by the user comprises comparing terms and conditions related to

the information related to the item that the user wishes to purchase with terms and conditions provided by an issuer.