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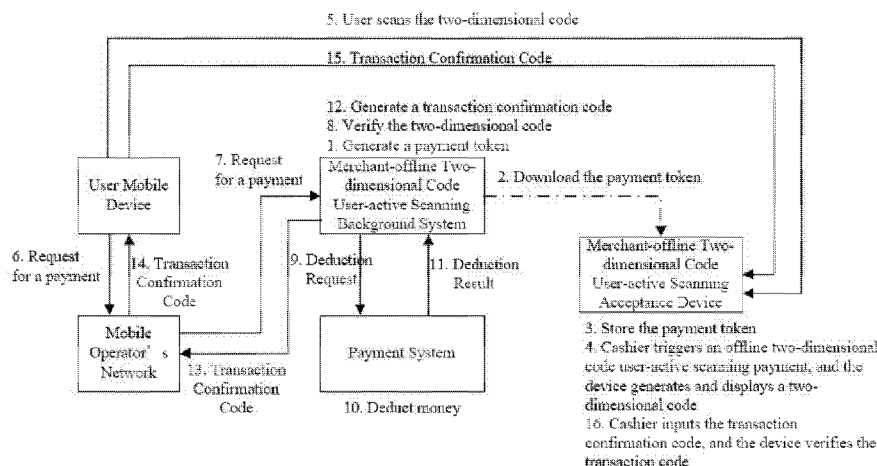


FIG. 1

(57) Abstract: The invention discloses a two-dimensional code active scanning payment acceptance method and apparatus and a two-dimensional code active scanning payment system. The two-dimensional code active scanning payment acceptance method is configured for providing a dynamic two-dimensional code for payment when a merchant is offline, which includes: receiving an input transaction amount; using a pre-stored payment token to encrypt a transaction time, a transaction place and the transaction amount to generate a payment ciphertext; generating a dynamic two-dimensional code and displaying the dynamic two-dimensional code; and receiving and verifying a transaction confirmation code. The apparatus is configured for executing the two-dimensional code active scanning payment acceptance method. The two-dimensional code active scanning payment system includes the apparatus and a two-dimensional code active scanning payment processing apparatus. The method and the apparatus of the invention allow merchants to be offline during the transaction, and the displayed two-dimensional code changes from static to dynamic, thus the safety is improved.

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**TWO-DIMENSIONAL CODE ACTIVE SCANNING PAYMENT ACCEPTANCE
METHOD AND APPARATUS, AND TWO-DIMENSIONAL CODE ACTIVE
SCANNING PAYMENT SYSTEM**

5 **TECHNICAL FIELD**

[0001] The invention relates to a field of bar code payment, in particular to a two-dimensional code active scanning payment acceptance method and apparatus and a two-dimensional code active scanning payment system.

10 **BACKGROUND**

[0002] In recent years, bar code and two-dimensional code payment have been very popular. Since third-party payment companies, such as Internet companies, launched bar code and two-dimensional code payment, traditional payment providers, such as banks, have also launched their own bar code and two-dimensional code payment schemes. Payment
15 organizations (such as EMV, VISA, UnionPay, etc.) have also issued bar code and two-dimensional code payment specifications on this basis. Generally speaking, existing bar code and two-dimensional code payment schemes mainly include the following two types:

[0003] 1) a user-active scanning scheme, in which users use mobile devices (such as mobile phones, tablets, etc.) to scan bar codes or two-dimensional codes provided by
20 merchants, where the two-dimensional codes may be dynamic two-dimensional codes or static two-dimensional codes. In the case of dynamic two-dimensional codes, merchants will usually be equipped with payment acceptance devices (such as mobile phones, tablets, smart payment terminals, retail point terminals and other customized devices, etc.); in the case of static two-dimensional codes, a merchant will usually post a printed two-dimensional code
25 representing the uniqueness of the merchant; and

[0004] 2) a user-passive scanning scheme, in which merchant cashiers use payment acceptance devices (such as mobile phones, tablets, smart payment terminals, retail point terminals and other customized devices, etc.) to scan bar codes or two-dimensional codes displayed on user mobile devices (such as mobile phones, tablets, etc.), which are usually
30 dynamic.

[0005] The user-active scanning scheme is applicable to small and micro merchants such as vegetable markets, canteen stalls, street vendors, vending machines and village stores, while the user-passive scanning scheme is applicable to medium-sized or large merchants such as chain stores, large supermarkets and shopping malls.

5 [0006] At present, it seems that bar code and two-dimensional code payment are permeating small and micro merchants, so the user-active scanning scheme is more lively.

[0007] For small and micro merchants adopting the user-active scanning scheme of bar code or two-dimensional code, the merchants usually have the following features:

10 [0008] 1) the merchants, for example, street vendors for which older people occupies a considerable proportion, or canteen stalls with large traffic, are generally inconvenient to carry mobile devices such as mobile phones or tablets;

[0009] 2) network connectivity of the merchants, such as villages or vending machines and so on, is limited; and

[0010] 3) the merchants' two-dimensional codes are usually static.

15 [0011] In view of the above features, the current user-active scanning scheme of bar code or two-dimensional code has the following disadvantages:

[0012] 1) merchants' static two-dimensional codes are less secure;

[0013] 2) the payment process is blocked due to the limited network connectivity of the merchants; and

20 [0014] 3) the merchants cannot confirm payment results due to the limited use of the merchants' mobile phones and tablets.

SUMMARY

25 [0015] The object of the present invention is to overcome the above-mentioned technical disadvantages and solve problems of the user-active scanning for barcodes or two-dimensional codes when merchants are offline by means of lightweight portable devices provided to the merchants or executable programs installed on the merchants' mobile devices.

[0016] In order to achieve the above object, the present invention adopts the following technical schemes:

30 [0017] A two-dimensional code active scanning payment acceptance method for

providing a dynamic two-dimensional code for payment when a merchant is offline, includes:

[0018] receiving an input transaction amount;

[0019] using a pre-stored payment token to encrypt a transaction time, a transaction place and the transaction amount to generate a payment ciphertext; generating a dynamic two-dimensional code and displaying the dynamic two-dimensional code; and

[0020] receiving and verifying a transaction confirmation code.

[0021] As an improvement of the above method, the method further includes:

[0022] downloading the payment token in advance, by downloading one or more payment tokens each time; and

[0023] storing the payment token.

[0024] A two-dimensional code active scanning payment processing method, includes:

[0025] generating a payment token;

[0026] receiving a transaction request containing a dynamic two-dimensional code;

[0027] verifying a payment ciphertext in the dynamic two-dimensional code; if the payment ciphertext passes the verification, generating and sending a deduction request; generating a transaction confirmation code after receiving a deduction notification; and

[0028] sending the transaction confirmation code.

[0029] A two-dimensional code active scanning payment acceptance apparatus, includes an input module, an encryption module, a two-dimensional code generation module and a two-dimensional code display module;

[0030] the input module is configured for inputting a payment amount or a transaction confirmation code;

[0031] the encryption module is configured for encrypting a transaction time, a transaction place and the transaction amount using a pre-stored payment token to generate a payment ciphertext;

[0032] the two-dimensional code generation module is configured for generating a dynamic two-dimensional code, which includes the transaction time, the transaction place, the transaction amount and the payment ciphertext; and

[0033] the two-dimensional code display module is configured for displaying the

dynamic two-dimensional code.

[0034] As an improvement of the above apparatus, the apparatus further includes a payment token downloading unit configured for downloading the payment token in advance.

[0035] A two-dimensional code active scanning payment system, includes: a
5 above-mentioned two-dimensional code active scanning payment acceptance apparatus and a two-dimensional code active scanning payment processing apparatus, the two-dimensional code active scanning processing apparatus being configured for generating a payment token;

[0036] receiving a transaction request containing a dynamic two-dimensional code;

[0037] verifying a payment ciphertext in the dynamic two-dimensional code; if the
10 payment ciphertext passes the verification, generating and sending a deduction request; generating a transaction confirmation code after receiving a deduction notification; and

[0038] sending the transaction confirmation code.

[0039] As an improvement of the above system, the transaction confirmation code is a number with 4-6 digits or a two-dimensional code.

[0040] As an improvement of the above system, the payment system includes a bank
15 payment system, a third-party payment system, and a service provider's closed-loop payment system.

[0041] The invention has the advantages that:

[0042] 1. due to the provision of a payment token valid for only one transaction,
20 two-dimensional codes displayed by merchants are changed from being static to being dynamic, and the safety is improved;

[0043] 2. due to the provision of low-cost merchant acceptance devices or executable
programs that may be installed on merchant mobile devices (mobile phones, tablets, smart
payment terminals, retail point terminals) by the present invention, merchants can be offline
25 during the transaction; and

[0044] 3. merchants can check the validity of the transaction offline when the transaction is completed.

BRIEF DESCRIPTION OF THE DRAWINGS

[0045] FIG. 1 is a schematic diagram of a merchant-offline two-dimensional code
30

active scanning system provided in Embodiment 1 of the present invention; and

[0046] FIG. 2 is a composition diagram of a merchant acceptance device provided in Embodiment 1 of the present invention.

5 DETAILED DESCRIPTION

[0047] The technical scheme of the present invention will be described in detail below with reference to specific embodiments and the accompanying drawings.

[0048] Embodiment 1

[0049] As shown in FIG. 1, Embodiment 1 of the present invention provides a
10 merchant-offline two-dimensional code active scanning payment system, which includes a merchant-offline two-dimensional code user-active scanning background system, a merchant-offline two-dimensional code user-active scanning acceptance device and a user mobile device.

[0050] The merchant-offline two-dimensional code user-active scanning background
15 system is referred to as a business background system conforming to the present proposal. It is configured for generating a payment token and also configured for verifying a payment request sent by the user mobile device, sending the payment request to the payment system after the verification is passed, and sending a transaction confirmation code to the user mobile device after the payment is successful; and the payment system is referred to as a
20 bank payment system, a third-party payment system and a service provider's closed-loop payment system, etc.

[0051] The merchant-offline two-dimensional code user-active scanning acceptance device is referred to as a customized lightweight portable device provided to the merchant or an executable program installed on the merchant's mobile device (a mobile phone, a tablet, a
25 smart payment terminal, a retail point terminal). Before the transaction, the merchant-offline two-dimensional code user-active scanning device needs to download and store the payment token in advance from the merchant-offline two-dimensional code user-active scanning background system.

[0052] The merchant acceptance device does not need to be online during the
30 transaction, thus solving the problem of difficult networking in scenes such as mobile

vendors, canteen stalls and the like. The merchant accepting device only needs to store payment tokens in batches through an Internet connection before the transaction.

[0053] As shown in FIG. 2, the present invention provides a low-cost merchant acceptance device, and minimum modules of the device include a two-dimensional code display screen, a keyboard, a two-dimensional code display module, a fixed Internet access module, an encryption module, and a central processing module.

[0054] The user mobile device is referred to as a device configured for two-dimensional code payment such as a mobile phone or a tablet, and is configured for accessing the merchant-offline two-dimensional code user-active scanning background system through a mobile operator's network; and the mobile operator's network is referred to as a 3G, 4G or WIFI network.

[0055] Embodiment 2

[0056] Embodiment 2 of the present invention provides a merchant-offline two-dimensional code active scanning system. Compared with Embodiment 1, the merchant-offline two-dimensional code user-active scanning acceptance device further has an alternative implementation, which is an executable program that may be installed on a merchant mobile device (a mobile phone, a tablet, a smart payment terminal, and a retail point terminal).

[0057] Embodiment 3

[0058] Embodiment 3 of the present invention provides a merchant-offline two-dimensional code active scanning method, which includes:

[0059] 1) A merchant-offline two-dimensional code user-active scanning background system generates a payment token. The payment token is used to generate a merchant's two-dimensional code, and each payment token can only be used once.

[0060] 2) A merchant-offline two-dimensional code user-active scanning acceptance device downloads the payment token through the Internet, and one or more payment tokens may be downloaded each time.

[0061] 3) The merchant-offline two-dimensional code user-active scanning acceptance device pre-stores the payment token.

[0062] After that, the merchant triggers a transaction process, which includes the

following steps:

[0063] 4) A cashier uses the merchant-offline two-dimensional code user-active scanning acceptance device to input a payment amount, and then the device encrypts a transaction time, a transaction place and the transaction amount by using a pre-stored payment token to obtain a payment ciphertext. The device then displays the merchant's two-dimensional code, which includes the transaction time, the transaction place, the transaction amount and the payment ciphertext.

[0064] 5) A user scans the merchant's two-dimensional code using a mobile device.

[0065] 6) The mobile device sends a transaction request to the background system through a mobile operator's network.

[0066] 7) The mobile operator's network transmits the transaction request to the merchant-offline two-dimensional code user-active scanning background system.

[0067] 8) The merchant-offline two-dimensional code user-active scanning background system verifies the transaction ciphertext contained in the two-dimensional code.

[0068] 9) If the transaction ciphertext passes the verification, the merchant-offline two-dimensional code user-active scanning background system sends a deduction request to the payment system.

[0069] 10) The payment system deducts money from the user's account.

[0070] 11) The payment system sends a deduction result to the merchant-offline two-dimensional code user-active scanning background system.

[0071] 12) The merchant-offline two-dimensional code user-active scanning background system generates a transaction confirmation code. The transaction confirmation code may be a number with 4-6 digits, which is input by a merchant cashier to the merchant-offline two-dimensional code user-active scanning acceptance device; and the transaction confirmation code may also be a two-dimensional code, which is scanned by the merchant-offline two-dimensional code user-active scanning device.

[0072] 13) The merchant-offline two-dimensional code user-active scanning background system sends the transaction confirmation code through the mobile operator's network.

[0073] 14) The mobile operator's network forwards the transaction confirmation code

to the user's mobile device.

[0074] 15) The user displays the transaction confirmation code to the merchant.

[0075] 16) The merchant-offline two-dimensional code user-active scanning device obtains the transaction confirmation code and verifies the transaction confirmation code.

5 [0076] The merchant offline two-dimensional code user-active scanning device receives the transaction confirmation code provided by the user, and uses the same algorithm as used in the background system to verify the transaction confirmation code in software or hardware offline.

[0077] Finally, it should be noted that the above embodiments are only used to
10 illustrate the technical schemes of the present invention and are not for purpose of limitation. Although the present invention has been described in detail with reference to the embodiments, it should be understood by those skilled in the art that any modification or equivalent replacement of the technical schemes of the present invention does not depart from the spirit and scope of the technical schemes of the present invention, all of which
15 should be covered by the scope of the claims of the present invention.

CLAIMS

1. A two-dimensional code active scanning payment acceptance method for providing a dynamic two-dimensional code for payment when a merchant is offline, includes:

5 receiving an input transaction amount;
using a pre-stored payment token to encrypt a transaction time, a transaction place and the transaction amount to generate a payment ciphertext; generating a dynamic two-dimensional code and displaying the dynamic two-dimensional code; and
receiving and verifying a transaction confirmation code.

10

2. The two-dimensional code active scanning payment acceptance method according to claim 1, wherein the method further includes:

downloading the payment token in advance, by downloading one or more payment tokens each time; and

15 storing the payment token.

3. A two-dimensional code active scanning payment processing method, includes:

generating a payment token;

receiving a transaction request containing a dynamic two-dimensional code;

20 verifying a payment ciphertext in the dynamic two-dimensional code; if the payment ciphertext passes the verification, generating and sending a deduction request; generating a transaction confirmation code after receiving a deduction notification; and
sending the transaction confirmation code.

25 4. A two-dimensional code active scanning payment acceptance apparatus, wherein the apparatus includes an input module, an encryption module, a two-dimensional code generation module and a two-dimensional code display module; wherein

the input module is configured for inputting a payment amount or a transaction confirmation code;

30 the encryption module is configured for encrypting a transaction time, a transaction

place and the transaction amount using a pre-stored payment token to generate a payment ciphertext;

the two-dimensional code generation module is configured for generating a dynamic two-dimensional code, which includes the transaction time, the transaction place, the transaction amount and the payment ciphertext; and

the two-dimensional code display module is configured for displaying the dynamic two-dimensional code.

5. The two-dimensional code active scanning payment acceptance apparatus according to claim 4, wherein the apparatus further includes a payment token downloading unit configured for downloading the payment token in advance.

6. A two-dimensional code active scanning payment system, wherein the system includes a two-dimensional code active scanning payment acceptance apparatus according to one of claims 4-5 and a two-dimensional code active scanning payment processing apparatus, wherein the two-dimensional code active scanning processing apparatus is configured for generating a payment token;

receiving a transaction request containing a dynamic two-dimensional code;

verifying a payment ciphertext in the dynamic two-dimensional code; if the payment ciphertext passes the verification, generating and sending a deduction request; generating a transaction confirmation code after receiving a deduction notification; and

sending the transaction confirmation code.

7. The two-dimensional code active scanning payment system according to claim 6, wherein the transaction confirmation code is a number with 4-6 digits or a two-dimensional code.

8. The two-dimensional code active scanning payment system according to claim 6, wherein the payment system includes a bank payment system, a third-party payment system and a service provider's closed-loop payment system.

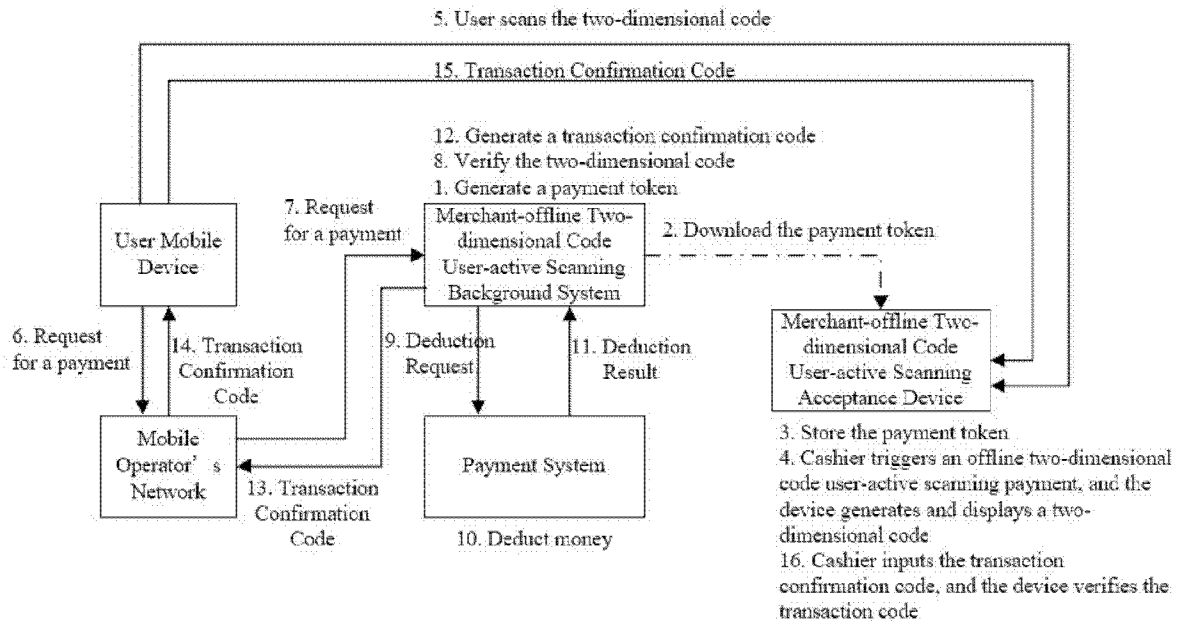


FIG. 1

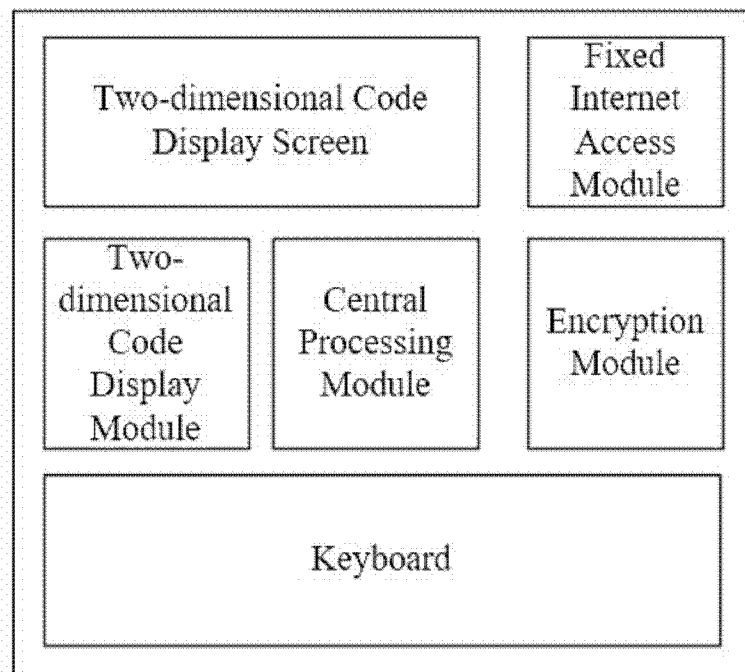


FIG. 2

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2019/127849

A. CLASSIFICATION OF SUBJECT MATTER

G06Q 20/32(2012.01)i; G06Q 20/36(2012.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

G06Q; G06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNABS,CNXTX,VEN,CNKI:payment, QR code, accept+, process+, offline, dynamic, token, encrypt+, ciphertext, time, place, amount+, request+, chargeback, verif+

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 107833046 A (HENGBAO CO LTD) 23 March 2018 (2018-03-23) description, paragraphs [0028]-[0084]	1-8
PX	CN 109829714 A (GIESECKE & DEVRIENT GMBH CHINA) 31 May 2019 (2019-05-31) the whole document	1-8
A	CN 105590199 A (CHINA UNIONPAY CO LTD) 18 May 2016 (2016-05-18) the whole document	1-8
A	CN 107180351 A (DYNAMICODE CO LTD) 19 September 2017 (2017-09-19) the whole document	1-8
A	CN 106910063 A (ASPIRE DIGITAL TECHNOLOGIES SHENZHEN CO) 30 June 2017 (2017-06-30) the whole document	1-8

☐ Further documents are listed in the continuation of Box C.
 ☒ See patent family annex.

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Date of the actual completion of the international search

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26 March 2020

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2019/127849

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN	107833046	A	23 March 2018	None	
CN	109829714	A	31 May 2019	None	
CN	105590199	A	18 May 2016	None	
CN	107180351	A	19 September 2017	None	
CN	106910063	A	30 June 2017	None	