

METHODS AND SYSTEMS FOR INITIATING A TRANSACTION

Technical Field and Background

[0001] The present disclosure relates to the initiation of payment transactions. In particular, it provides methods and systems for initiating transactions in response to an event.

[0002] Some services such as taxi and minicab journeys can be booked in advance. However, when a passenger on another form of transport such as air travel or train wishes to book a taxi or minicab following arrival at an airport or station, there is a risk that if the initial journey is delayed, the booking may be missed or substantial waiting charges may be incurred.

[0003] Further, certain products with limited availability may be offered for sale from a certain time. If a product is offered for sale starting at, for example, midnight, then customers must be awake at this time to make a purchase or risk the product being sold out.

Summary

[0004] In general terms, the present disclosure proposes methods and systems for initiating a transaction. A cardholder of a payment card account may set a transaction trigger event in response to which a payment transaction is initiated. The transaction trigger event may be set as the arrival of a flight, the arrival of a passenger at a given location or a product or service being offered for sale.

[0005] According to a first aspect of the present invention, there is provided a computer implemented method of initiating a transaction. The method comprises: receiving a transaction initiation request, the transaction initiation request comprising an indication of a merchant; an indication of a transaction trigger condition; and an indication of a payment card account; monitoring an event status and comparing the event status with the transaction trigger condition; and in response to the event status matching the transaction trigger condition, initiating a transaction between the payment card account indicated by the indication of the payment card account and the merchant indicated by the indication of the merchant.

[0006] In an embodiment the transaction indication request further comprises an indication of a booking. The booking may be a booking for a taxi or minicab service.

[0007] In an embodiment, the transaction trigger condition is the arrival of a transport service at a location. Monitoring the event status may comprise receiving an indication of an arrival status of a transport service.

[0008] In an embodiment, the trigger event is the arrival of a global navigation satellite system enabled device at a trigger location. Monitoring the event status may comprise receiving a signal indicating the position of a global navigation satellite system enabled device. Monitoring the event status may comprise repeatedly sending position indication requests to the global navigation satellite system enabled device. The separation of the position indication requests may be adjusted depending on the distance between the position of the global navigation satellite system enabled device and the trigger location.

[0009] In an embodiment, the transaction indication further comprises an indication of a product purchase. The transaction trigger condition may be the beginning of a sale or offer for sale of a product or service.

[0010] In an embodiment, the method further comprises sending an indication of the transaction to a device associated with a cardholder of the payment card account.

[0011] In an embodiment, the method further comprises generating a transaction pre-approval request in response to receiving the transaction initiation request.

[0012] According to a second aspect of the present invention, there is provided a system for processing a transaction authorization request. The system comprises: a computer processor and a data storage device, the data storage device having a monitoring module; and a transaction initiation module comprising non-transitory instructions operative by the processor to: receive a transaction initiation request, the transaction initiation request comprising an indication of a merchant; an indication of a transaction trigger condition; and an indication of a payment card account; monitor an event status and comparing the event status with the transaction trigger condition; and in response to the event status matching the transaction trigger condition, initiate a transaction between the payment card account indicated by the indication of the payment card account and the merchant indicated by the indication of the merchant.

[0013] According to a yet further aspect, there is provided a non-transitory computer-readable medium. The computer-readable medium has stored thereon program instructions for causing at least one processor to perform operations of a method disclosed above.

Brief Description of the Drawings

[0014] Embodiments of the invention will now be described for the sake of non-limiting example only, with reference to the following drawings in which:

Fig. 1 is a block diagram of a data processing system according to an embodiment of the present invention;

Fig. 2 is a block diagram illustrating a technical architecture of the apparatus according to an embodiment of the present invention; and

Fig. 3 is a flowchart illustrating a method of initiating a transaction according to an embodiment of the present invention.

Detailed Description

[0015] As used herein, the term “payment card” refers to any suitable cashless payment device, such as a credit card, a debit card, a prepaid card, a charge card, a membership card, a promotional card, a frequent flyer card, an identification card, a prepaid card, a gift card, and/or any other device that may hold payment account information, such as mobile phones, Smartphones, personal digital assistants (PDAs), key fobs, transponder devices, NFC-enabled devices, and/or computers. Each type of payment card can be used as a method of payment for performing a transaction.

[0016] Figure 1 is a block diagram showing a data processing system according to an embodiment of the present invention. The data processing system comprises a card holder device 110; a transaction initiation server 120; a travel operator information server 130 and a merchant booking / purchase server 140. As described in more detail below, the system allows a cardholder of a payment card account to send a transaction initiation request to the transaction initiation server 120. In response to the transaction initiation request, the transaction initiation server 120 monitors an event status and determines whether a transaction trigger event has occurred. When the transaction trigger event occurs, the transaction initiation server 120 initiates a transaction with the merchant booking / purchase server 140.

[0017] In embodiments of the present invention, various events may be set as the trigger for initiating a transaction. The cardholder device 110 is, for example, a smartphone or tablet device. The cardholder device 115 has a global navigation satellite system (GNSS) module which functions to determine the location of the cardholder device 115, based on signals

from satellite systems such as GPS, GLONASS, Galileo, BeiDou or the like. One such trigger event for initiating a transaction is the cardholder device 110 arriving at a specified location. The travel operator information server 130 is a server associated with a travel operator such as an airline, a rail network or a bus network. In some embodiments, the travel operator information server may be associated with an airport, a railway or bus station. In some embodiments, the travel operator information server 130 may provide information relating to a plurality of travel operators. The travel operator information server 130 provides information about the arrival or expected arrival of travel services such as airline flights. This information may be provided through an application programming interface (API).

[0018] The merchant booking / purchase server is a server associated with a merchant such as an online retailer or a service provider such as a taxi or minicab operator. The merchant booking / purchase server 140 allows online booking or purchases to be made. In some embodiments information from the merchant booking / purchase server acts as the trigger for initiating a transaction. For example, the trigger may be an item being offered for sale at a certain price. This item may for example be the launch of a new product or tickets for an event such as a concert or sports event. It is noted that such items may have a very limited supply and often sell out soon after being put on sale.

[0019] Figure 2 is a block diagram showing a technical architecture of the server of the transaction initiation server 200 for performing an exemplary method 300 is described below with reference to Figure 3. Typically, the method 300 is implemented by a computer having a data-processing unit. The block diagram as shown Figure 2 illustrates a technical architecture 200 of a computer which is suitable for implementing one or more embodiments herein.

[0020] The technical architecture 200 includes a processor 222 (which may be referred to as a central processor unit or CPU) that is in communication with memory devices including secondary storage 224 (such as disk drives), read only memory (ROM) 226, and random access memory (RAM) 228. The processor 222 may be implemented as one or more CPU chips. The technical architecture 200 may further comprise input/output (I/O) devices 230, and network connectivity devices 232.

[0021] The secondary storage 224 is typically comprised of one or more disk drives or tape drives and is used for non-volatile storage of data and as an over-flow data storage device if RAM 228 is not large enough to hold all working data. Secondary storage 224 may be

used to store programs which are loaded into RAM 228 when such programs are selected for execution. In this embodiment, the secondary storage 224 has a monitoring module 224a, a transaction initiation module 224b, and a transaction notification module 224c comprising non-transitory instructions operative by the processor 222 to perform various operations of the method of the present disclosure. As depicted in Figure 2, the modules 224a-224c are distinct modules which perform respective functions implemented by the electronic commerce analysis server 200. It will be appreciated that the boundaries between these modules are exemplary only, and that alternative embodiments may merge modules or impose an alternative decomposition of functionality of modules. For example, the modules discussed herein may be decomposed into sub-modules to be executed as multiple computer processes, and, optionally, on multiple computers. Moreover, alternative embodiments may combine multiple instances of a particular module or sub-module. It will also be appreciated that, while a software implementation of the modules 224a-224c is described herein, these may alternatively be implemented as one or more hardware modules (such as field-programmable gate array(s) or application-specific integrated circuit(s)) comprising circuitry which implements equivalent functionality to that implemented in software. The ROM 226 is used to store instructions and perhaps data which are read during program execution. The secondary storage 224, the RAM 228, and/or the ROM 226 may be referred to in some contexts as computer readable storage media and/or non-transitory computer readable media.

[0022] I/O devices 230 may include printers, video monitors, liquid crystal displays (LCDs), plasma displays, touch screen displays, keyboards, keypads, switches, dials, mice, track balls, voice recognizers, card readers, paper tape readers, or other well-known input devices.

[0023] The network connectivity devices 232 may take the form of modems, modem banks, Ethernet cards, universal serial bus (USB) interface cards, serial interfaces, token ring cards, fiber distributed data interface (FDDI) cards, wireless local area network (WLAN) cards, radio transceiver cards that promote radio communications using protocols such as code division multiple access (CDMA), global system for mobile communications (GSM), long-term evolution (LTE), worldwide interoperability for microwave access (WiMAX), near field communications (NFC), radio frequency identity (RFID), and/or other air interface protocol radio transceiver cards, and other known network devices. These network connectivity devices 232 may enable the processor 222 to communicate with the Internet or one or more intranets. With such a network connection, it is contemplated that the processor 222 might receive information from the network, or might output information to

the network in the course of performing the above-described method operations. Such information, which is often represented as a sequence of instructions to be executed using processor 222, may be received from and outputted to the network, for example, in the form of a computer data signal embodied in a carrier wave.

[0024] The processor 222 executes instructions, codes, computer programs, scripts which it accesses from hard disk, floppy disk, optical disk (these various disk based systems may all be considered secondary storage 224), flash drive, ROM 226, RAM 228, or the network connectivity devices 232. While only one processor 222 is shown, multiple processors may be present. Thus, while instructions may be discussed as executed by a processor, the instructions may be executed simultaneously, serially, or otherwise executed by one or multiple processors.

[0025] Although the technical architecture 200 is described with reference to a computer, it should be appreciated that the technical architecture may be formed by two or more computers in communication with each other that collaborate to perform a task. For example, but not by way of limitation, an application may be partitioned in such a way as to permit concurrent and/or parallel processing of the instructions of the application. Alternatively, the data processed by the application may be partitioned in such a way as to permit concurrent and/or parallel processing of different portions of a data set by the two or more computers. In an embodiment, virtualization software may be employed by the technical architecture 200 to provide the functionality of a number of servers that is not directly bound to the number of computers in the technical architecture 200. In an embodiment, the functionality disclosed above may be provided by executing the application and/or applications in a cloud computing environment. Cloud computing may comprise providing computing services via a network connection using dynamically scalable computing resources. A cloud computing environment may be established by an enterprise and/or may be hired on an as-needed basis from a third party provider.

[0026] It is understood that by programming and/or loading executable instructions onto the technical architecture 200, at least one of the CPU 222, the RAM 228, and the ROM 226 are changed, transforming the technical architecture 200 in part into a specific purpose machine or apparatus having the novel functionality taught by the present disclosure. It is fundamental to the electrical engineering and software engineering arts that functionality that can be implemented by loading executable software into a computer can be converted to a hardware implementation by well-known design rules.

[0027] Various operations of an exemplary method 300 will now be described with reference to Figure 3 in respect of initiating a transaction. It should be noted that enumeration of operations is for purposes of clarity and that the operations need not be performed in the order implied by the enumeration.

[0028] In step 302, the transaction initiation server 120 receives a transaction initiation request from the cardholder device 110. The transaction initiation request comprises an indication of a merchant at which a transaction is to be initiated, an indication of a transaction trigger condition, and an indication of a payment card account on which the transaction is to be initiated. Additionally, the transaction initiation request may comprise an indication of products and / or services to be purchased.

[0029] In one embodiment, the transaction initiation request comprises a booking for a taxi. The transaction initiation request further comprises an indication of the taxi journey, for example an indication of the start point and the end point. In such an embodiment, the indication of the transaction trigger condition corresponds to the arrival of a passenger at a particular location such as an airport, a bus station, or railway station.

[0030] The transaction trigger condition may be the arrival of a flight at an airport; in this case the transaction initiation request may include an indication of a flight number of other indication of the flight and the airport. In some embodiments, the transaction initiation request may allow the cardholder to input a delay between, for example, the flight arriving and the taxi booking. This would allow, for example, the passenger time to pass through immigration and baggage claim before boarding the taxi.

[0031] The transaction trigger condition may be defined by the GNSS location of the cardholder device 110. For example, the transaction may be triggered by the cardholder device 110 reaching a particular location. This location may be the start point of the taxi journey. Such embodiments may correspond to a situation when a cardholder is a passenger on a bus or rail journey, thus the arrival of the cardholder at their destination would be indicated by the arrival of the cardholder device 110 at a specified location. In some embodiments, the trigger may be defined as the cardholder device reaching a location within, for example, 10 km of the start point of the taxi journey. This would allow a period of time for the taxi to travel to the start location.

[0032] In the examples described above, the trigger condition is defined by the GNSS location of the cardholder device 110, in some embodiments, the trigger condition may be defined

by the location of the device owned by another person. In such embodiments, the device owned by that person may run an application which reports the location to the transaction initiation server 120. The transaction initiation request may include an indication of an identifier of the device, for example, a telephone number or other device identifier that allows the transaction initiation server 120 to identify and contact the device. Such embodiments may be used where the taxi is being booked and paid for by a different person from the passenger on the journey.

[0033] In one embodiment, the transaction initiation request comprises a transaction request for a purchase, for example, for a newly launched product, a limited edition product, or a ticket to an event with limited availability. In such an embodiment, the transaction initiation request comprises an indication of the online retailer or merchant selling the product and an indication of when sale of the product will begin. The transaction initiation request may also comprise an indication of the product to purchase, a quantity of products to purchase, a maximum price and other details of the potential purchase.

[0034] In step 304, the monitoring module 224a of the transaction initiation server 120 monitors the event status to determine whether the transaction trigger condition has been met. As described above in relation to step 302, there are various possible transaction trigger conditions. The nature of the processing carried out by the monitoring module 224a of the transaction initiation server 120 in step 304 may depend on the transaction trigger condition.

[0035] As mentioned above, in some embodiments, the transaction trigger condition is the arrival of a flight, train or other type of transport service. In such embodiments, the monitoring module 224a of the transaction initiation server 120 monitors the travel operator information server 130 to determine event status. The monitoring may comprise receiving information from an application programming interface (API). Alternatively, the monitoring may comprise accessing status information from a website.

[0036] In some embodiments, the transaction trigger condition is based on the location of the cardholder device 110 or other device determined from the GNSS module 115. In such embodiments, the monitoring module 224a of the transaction initiation server 120 may periodically receive an indication from the cardholder device 110 of the location of the cardholder device 110. The monitoring module 224a of the transaction initiation server 120 may request the cardholder device 110 to send the location information. The timing of the requests for the location information may be varied by the monitoring module 224a

depending on the distance of the cardholder device from the location corresponding to the transaction trigger condition. For example, when the cardholder device 110 is far from the location corresponding to the transaction trigger condition, for example more than 50 km away, the requests for the location information may be spaced by time intervals of 10 to 15 minutes, and when the cardholder device 110 is near to the location corresponding to the transaction trigger condition, for example less than 50 km away, the requests for the location information may be spaced by shorter intervals, for example 2 to 5 minutes apart.

[0037] In some embodiments, the transaction trigger condition is based on the offer of a certain product for sale. The transaction trigger condition may also specify a maximum price or price range for the products. In such embodiments, the monitoring module 224a of the transaction initiation server 120 monitors the merchant booking / purchase server 140 to determine whether the product is being offered for sale and the price. In some embodiments, the transaction initiation request may indicate a start time for the sale of the products, in such embodiments, the monitoring module 224a of the transaction initiation server 120 may begin monitoring at the indicated start time or at a time interval of, for example, 10 minutes before the indicated start time.

[0038] In step 306, the transaction initiation module 224b initiates a transaction using the payment card account indicated in the transaction initiation request in response to the monitoring module 224a determining that the transaction trigger event has occurred. In some embodiments, the transaction is initiated immediately after the transaction trigger event occurs, in other embodiments, a time delay occurs between the trigger event and the initiation of the transaction.

[0039] In some embodiments, the transaction initiation module 224b may pre-authorize the transaction in response to the transaction initiation server 120 receiving the transaction initiation request.

[0040] Following step 306, in some embodiments, the transaction notification module 224c of the transaction initiation server 120 may send an indication that the transaction has been successfully initiated to the cardholder device 110. This indication may take the form of an email message or a text message.

[0041] Whilst the foregoing description has described exemplary embodiments, it will be understood by those skilled in the art that many variations of the embodiment can be made within the scope and spirit of the present invention.

Claims

1. A computer implemented method of initiating a transaction, the method comprising
receiving a transaction initiation request, the transaction initiation request comprising an indication of a merchant; an indication of a transaction trigger condition; and an indication of a payment card account;
monitoring an event status and comparing the event status with the transaction trigger condition; and
in response to the event status matching the transaction trigger condition, initiating a transaction between the payment card account indicated by the indication of the payment card account and the merchant indicated by the indication of the merchant.
2. A method according to claim 1, wherein the transaction indication request further comprises an indication of a booking.
3. A method according to claim 2, wherein the booking is a booking for a taxi or minicab service.
4. A method according to any one of claims 2 to 3, wherein the transaction trigger condition is the arrival of a transport service at a location.
5. A method according to any preceding claim wherein monitoring an event status comprises receiving an indication of an arrival status of a transport service.
6. A method according to any preceding claim wherein the trigger event is the arrival of a global navigation satellite system enabled device at a trigger location.
7. A method according to claim 6, wherein monitoring an event status comprises receiving a signal indicating the position of a global navigation satellite system enabled device.
8. A method according to claim 7, wherein monitoring an event status comprises repeatedly sending position indication requests to the global navigation satellite system enabled device.

9. A method according to claim 8, wherein monitoring an event status further comprises adjusting the separation of the position indication requests depending on the distance between the position of the global navigation satellite system enabled device and the trigger location.
10. A method according to claim 1, wherein the transaction indication further comprises an indication of a product purchase.
11. A method according to claim 10, wherein the transaction trigger condition is the beginning of a sale or offer for sale of a product or service.
12. A method according to any preceding claim, further comprising sending an indication of the transaction to a device associated with a cardholder of the payment card account.
13. A method according to any preceding claim, further comprising generating a transaction pre-approval request in response to receiving the transaction initiation request.
14. A non-transitory computer readable medium having stored thereon program instructions for causing at least one processor to perform a method according to any preceding claim.
15. A system for processing a transaction authorization request, the system comprising:
a computer processor and a data storage device, the data storage device having a monitoring module; and a transaction initiation module comprising non-transitory instructions operative by the processor to:
receive a transaction initiation request, the transaction initiation request comprising an indication of a merchant; an indication of a transaction trigger condition; and an indication of a payment card account;
monitor an event status and comparing the event status with the transaction trigger condition; and
in response to the event status matching the transaction trigger condition, initiate a transaction between the payment card account indicated by the indication of the payment card account and the merchant indicated by the indication of the merchant.
16. A system according to claim 15, wherein the transaction indication request further comprises an indication of a booking.

17. A system according to claim 16, wherein the booking is a booking for a taxi or minicab service.

18. A system according to any one of claims 16 to 17, wherein the transaction trigger condition is the arrival of a transport service at a location.

19. A system according to any one of claims 15 to 18, wherein the monitoring module further comprises non-transitory instructions operative by the processor to: monitor an event status by receiving an indication of an arrival status of a transport service.

20. A system according to any one of claims 15 to 19, wherein the trigger event is the arrival of a global navigation satellite system enabled device at a trigger location.

21. A system according to claim 20, wherein the monitoring module further comprises non-transitory instructions operative by the processor to: receive a signal indicating the position of a global navigation satellite system enabled device.

22. A system according to claim 21, wherein the monitoring module further comprises non-transitory instructions operative by the processor to: repeatedly sending position indication requests to the global navigation satellite system enabled device.

23. A system according to claim 22, wherein the monitoring module further comprises non-transitory instructions operative by the processor to: adjust the separation of the position indication requests depending on the distance between the position of the global navigation satellite system enabled device and the trigger location.

24. A system according to claim 15, wherein the transaction indication further comprises an indication of a product purchase.

25. A system according to claim 24, wherein the transaction trigger condition is the beginning of a sale or offer for sale of a product or service.

26. A system according to any one of claims 15 to 25, the data storage device further comprising transaction notification module comprising non-transitory instructions operative

by the processor to: send an indication of the transaction to a device associated with a cardholder of the payment card account.

26. A system according to any one of claims 15 to 26, wherein the transaction initiation module further comprises non-transitory instructions operative by the processor to: generate a transaction pre-approval request in response to receiving the transaction initiation request.