

## **SYSTEM AND METHOD FOR FUNDING A PREPAID CARD**

### **FIELD OF INVENTION**

[0001] The present invention relates broadly, but not exclusively, to a system and method for funding a prepaid card.

### **BACKGROUND**

[0002] A prepaid card can store monetary value that can be used for conducting cashless payments. It is usually possible to top-up the monetary value on the prepaid card using various payment methods, such as cash, credit/debit cards, etc.

[0003] One of the examples of a prepaid card is a fare card to make fare payments for using a public transport. Frequent commuters would usually choose to use the fare card, instead of a ticket, for their convenience and possibly some concessions. Commuters will tap the fare card on a card reader at the beginning and end of a trip.

[0004] Currently, commuters have to queue up at a top-up machine or a counter to top-up the value of the fare card. This can be very time-consuming. Also, commuters may find out that the fare card has insufficient value at a station where no top-up machine or counter is available. As a result, the commuters may be forced to use other modes of payment. Otherwise, the commuters may be denied entry.

[0005] A need therefore exists to provide a system and method that addresses at least one of the problems above or to provide a useful alternative.

### **SUMMARY**

[0006] According to a first aspect of the present invention, there is provided a system for funding a prepaid card, comprising:

- a database; and

- a computer module in communication with the database and a terminal, wherein the terminal is configured to read card data stored on the prepaid card, and wherein the computer module is configured to:

- receive, from the terminal, card data stored on the prepaid card;

determine whether the prepaid card needs to be funded;  
if the prepaid card needs to be funded, retrieve, based on the received card data, funding data and historical data associated with the prepaid card from the database;  
determine a funding value for funding the prepaid card based on the historical data; and  
authorise the funding of the prepaid card using the retrieved funding data and the determined funding value.

[0007] The computer module may be further configured to:

receive, from the terminal, funding data of at least one funding account; and  
store the funding data at the database, such that the funding data is retrievable for funding the prepaid card.

[0008] The computer module may be further configured to:

receive, from the terminal, a selection of the funding account to fund the prepaid card; and  
retrieve the funding data from the database based on the selection of the funding account.

[0009] The funding account may comprise a reward account for holding one or more rewards redeemable for funding the prepaid card.

[0010] The funding account may comprise one of the following: a bank account, an online payment account, a credit card account, a debit card account and a digital wallet account.

[0011] The computer module may be further configured to:

retrieve historical data comprising historical commuting data associated with the prepaid card from the database; and  
determine the funding value for funding the prepaid card based on the historical commuting data.

[0012] The computer module may be further configured to:

retrieve historical data comprising historical funding values associated with the prepaid card from the database; and determine the funding value for funding the prepaid card based on the historical funding values.

[0013] The computer module may be further configured to process an authentication input from a cardholder of the prepaid card to authorise the funding of the prepaid card.

[0014] The computer module may be further configured to transmit the funding data retrieved from the database to a payment network to authorise the funding of the prepaid card.

[0015] The computer module may be further configured to retrieve balance details associated with the prepaid card based on the received card data to determine whether the prepaid card needs to be funded.

[0016] The computer module may be further configured to:

- display, at the terminal, a confirmation message after determining that the prepaid card needs to be funded; and

- retrieve funding data associated with the prepaid card after receiving a cardholder response to the confirmation message.

[0017] According to a second aspect of the present invention, there is provided a method for funding a prepaid card, the method comprising the steps of:

- receiving, from a terminal, card data stored on the prepaid card;

- determining whether the prepaid card needs to be funded;

- if the prepaid card needs to be funded, retrieving, based on the received card data, funding data and historical data associated with the prepaid card from a database;

- determining a funding value for funding the prepaid card based on the historical data; and

- authorising the funding of the prepaid card using the retrieved funding data and the determined funding value.

[0018] According to a third aspect of the present invention, there is provided a system for funding a prepaid card, comprising:

- a database; and

- a computer module in communication with the database, an entrance terminal and an exit terminal, wherein the entrance and exit terminals are configured to read card data stored on the prepaid card, and wherein the computer module is configured to:

- receive, from the entrance terminal, card data stored on the prepaid card and information of a departing station;

receive, from the exit terminal, card data stored on the prepaid card and information of an arriving station;

determine a fare payable based on information of the departing and arriving stations;

determine whether the prepaid card needs to be funded;

if the prepaid card needs to be funded, retrieve, based on the received card data, funding data associated with the prepaid card from the database; and

authorise the funding of the prepaid card using the retrieved funding data and the determined fare.

[0019] The computer module may be further configured to:

receive funding data of at least one funding account; and

store the funding data at the database, such that the funding data is retrievable for funding the prepaid card.

[0020] The computer module may be further configured to:

receive a selection of the funding account to fund the prepaid card; and

retrieve the funding data from the database based on the selection of the funding account.

[0021] The funding account may comprise a reward account for holding one or more rewards redeemable for funding the prepaid card.

[0022] The funding account may comprise one of the following: a bank account, an online payment account, a credit card account, a debit card account and a digital wallet account.

[0023] The computer module may be further configured to process an authentication input from a cardholder of the prepaid card to authorise the funding of the prepaid card.

[0024] The computer module may be further configured to transmit the funding data retrieved from the database to a payment network to authorise the funding of the prepaid card.

[0025] According to a fourth aspect of the present invention, there is provided a method for funding a prepaid card, the method comprising the steps of:

receiving, from an entrance terminal, card data stored on the prepaid card and information of a departing station;

receiving, from an exit terminal, card data stored on the prepaid card and information of an arriving station;

determining a fare payable based on information of the departing and arriving stations;

determining whether the prepaid card needs to be funded;

if the prepaid card needs to be funded, retrieving, based on the received card data, funding data associated with the prepaid card from a database; and

authorising the funding of the prepaid card using the retrieved funding data and the determined fare.

## **BRIEF DESCRIPTION OF THE DRAWINGS**

[0026] Embodiments of the invention 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 and the drawings, in which:

[0027] Figure 1 shows a diagram illustrating a system and method for funding a prepaid card in accordance with an example embodiment.

[0028] Figure 2 shows a flow chart illustrating a method for funding a prepaid card in accordance with an example embodiment.

[0029] Figure 3 shows a flow chart illustrating a method for funding a prepaid card in accordance with a further example embodiment.

[0030] Figure 4 shows a schematic diagram illustrating a computer suitable for implementing the system and method of the example embodiments.

## **DETAILED DESCRIPTION**

### **Overview**

[0031] Various embodiments provide systems and methods for funding a prepaid card.

[0032] A prepaid card is a stored-value card that can be used to make cashless payments. The prepaid card details, such as the monetary value, can be stored on the prepaid card itself or on a database maintained by an issuer of the prepaid card. Some examples of prepaid cards include gift cards and transport fare cards.

[0033] The embodiments relate to systems and methods that allow cardholders to top-up the prepaid card in a simple manner. Specifically, the prepaid card is linked with one or more funding accounts that can be used to top-up the prepaid card. Some examples of funding accounts are digital wallet, credit/debit card account and reward account. The details of the funding accounts are stored in a database and retrieved as required for topping up the prepaid card.

[0034] In the following description, the embodiments are explained with respect to funding a prepaid card used by commuters to make train fare payments. Hence, the prepaid card is hereinafter referred to as “fare card”. It should be noted that, instead of train fare payments, funding a prepaid card which is used for other types of payments is also possible in other implementations. For example, the prepaid card may be a value card that can be used for purchasing an item in a particular store and embodiments of the present invention can be implemented to fund the value card.

[0035] In an example, the top-up process occurs at the entrance gantry (hereinafter referred to as “gantry”) of the train station. The commuter taps the fare card at the gantry to request access to the train station. The entrance gantry is configured to read card data from the fare card. The card data read from the fare card will be transmitted to a computer module to determine whether the fare card needs to be funded. Specifically, if there is insufficient value on the fare card for a train ride, a display screen at the gantry will prompt the commuter to top-up the fare card. For example, the display screen shows balance details and ask if the commuter wishes to top-up the value with “yes” and “no” options. If the commuter agrees to top-up the fare card, the display screen requests the commuter to provide an authentication input for cardholder authentication.

[0036] In an embodiment, the commuter is requested to select the amount to top-up. In a further embodiment, the commuters may be prompted to top-up the prepaid card by a fixed top-up value.

[0037] In another embodiment, the database stores historical data (e.g. historical commuting data and historical funding values) associated with the prepaid card and the top-up value may be automatically determined based on the historical data. For example, the fare card is left with a balance of 1 dollar when the commuter taps the fare card at the gantry. The computer module retrieves the historical commuting data and finds that the commuter frequently commutes to a particular station from the current station which will cost 5 dollars. Thus, the display screen prompts the commuter to top-up the value of the fare card by 4 dollars (5 dollars – 1 dollar = 4 dollars).

[0038] In yet another embodiment, the database stores historical funding values associated with the prepaid card and the top-up value may be automatically determined based on the historical funding values. For example, the computer module retrieves the historical funding values and finds that the commuter typically top-up the value of the prepaid card by 20 dollars. Thus, the display screen prompts the commuter to top-up the fare card by 20 dollars.

[0039] In a further embodiment, the computer module receives information of a departing station when the commuter taps the fare card at the entrance gantry. The computer module is communicatively coupled with exit gantries of train stations, such that the station where the commuter alighted can be determined when the commuter taps the fare card at the exit gantry. The computer module can calculate the fare that is payable by the commuter based on the information of the departing and arriving stations. The fare payable is then topped up to the fare card when the commuter leaves the arriving station.

[0040] Advantageously, if the top-up value is automatically determined, the commuter does not need to select the top-up value and the top-up process can occur faster.

[0041] The funding data of a funding account is retrieved from the database. For example, if the funding account linked to the prepaid card is a credit/debit card, the credit/debit card details are retrieved from the database and sent to a payment network to request funding of the fare card using the credit/debit card. In another example, if the funding account is a reward account, then the fare card is topped up using the rewards redeemed from the reward account.

[0042] As noted above, there may be more than one funding account that can be used to top-up the fare card. If there is more than one funding account, the commuter is allowed to select the funding account in the particular top-up process. In an example, the display screen provides 3 options (e.g. 1<sup>st</sup> option - linked card, 2<sup>nd</sup> option - top-up history and 3<sup>rd</sup> option - rewards) for topping up the fare card. The first option is related to using a funding account that has been specifically registered by the commuter for topping up the fare card. The second option is related to using a funding account that had been used in a previous top-up process. For example, the commuter may have used a particular credit/debit card to top-up the fare card previously and the details of this credit/debit card are automatically stored in the database. The storage of the credit/debit card details allows the credit/debit card to be reused for topping up the fare card in the future. The third option is related to a reward account which stores rewards (e.g. loyalty points, free train rides, etc.) earned by the commuter and redeemable to top-up the fare card.

[0043] In an embodiment, the entrance and/or exit gantries do not include a display screen and the process of topping up the fare card can automatically occur without any input or selection by the commuter. For example, the commuter has provided an authorisation to top-up the fare card if the balance on the fare card is below a predetermined value and has preselected a default funding account for topping up the fare card. Thus, when the card reader at the gantry reads the fare card and the computer module determines that the fare card contains low balance, the fare card is automatically topped up using the funding account pre-selected by the commuter.

[0044] It should be noted that the commuter may still need to provide authentication input even if the entrance and/or exit gantries do not include a display screen. For example, details of the commuter's mobile device may be stored in the database. A QR code may be sent to the commuter's mobile device and the commuter is required to scan the QR code at the gantry in order to top-up the fare card. In another example, the commuter may be requested to provide biometrics authentication (e.g. fingerprint) at the gantry.

[0045] Advantageously, the process of topping up and entering/exiting the train station may occur simultaneously at the gantry of the train station. The commuter does not have to queue up at the top-up machine to add the value on the fare card before entering the train station. Also, the commuter may not need to provide the details of the

funding account to add the value on the fare card. Further, the value for funding the fare card may be automatically determined during the top-up process. As a result, the top-up process is relatively faster and easier.

[0046] Advantageously, even if there is no top-up machine or counter, the commuter can still add value on the fare card.

[0047] Advantageously, the identity of the cardholders may be authenticated during the top-up process. This may provide a more secure top-up process.

#### Terms Description (in addition to plain and dictionary meaning of terms)

[0048] In the following description, the term “prepaid card” refers to any suitable transaction card, such as a value card, 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 gift card, and/or any other device that may hold an account information, such as mobile phones, personal digital assistants (PDAs), key fobs, and/or computers. The prepaid card is used for conducting financial transactions using prepaid money stored in the prepaid card. The information of the prepaid card can be stored externally in a database maintained by an issuer of the prepaid card. Alternatively, the information of the prepaid card can simply be stored on the prepaid card itself.

[0049] In the following description, the term “terminal” refers to any machine that can read data from the prepaid card. The terminal may also allow user input and selection, such as submitting a request for topping up the prepaid card and inputting password for cardholder authentication. In an embodiment, the terminal is a gantry at a train station. The gantry includes a card reader which can read information from the prepaid card and, optionally, includes a display screen for user input and selection.

[0050] In the following description, the term “database” refers to a single computing device or a plurality of interconnected computing devices which operate together to store information related to the prepaid card, such as cardholder details (e.g. name, phone number, PIN, etc.), funding data (e.g. details of credit/debit card, digital wallet and reward account which can be used for topping up the prepaid card) and prepaid card details (e.g. balance details, card ID, as well as historical data such as historical commuting data and historical funding values).

[0051] In the following description, the term “computer module” refers to a computer system communicatively coupled with the terminal and database. The computer module receives information from the terminal and the database for performing the steps of funding the prepaid card. An exemplary computer module is described below with reference to Figure 4.

[0052] In the following description, the term “funding account” refers to a financial account that can be used to fund the prepaid card. Some examples of a funding account include a credit/debit card account, digital wallet account and reward account. The term “funding data” refers to the data of the funding account.

[0053] In the following description, the term “historical data” refers to data related to the number of times a particular activity occurs using the prepaid card.

[0054] In the following description, the term “historical commuting data” refers to any data that may be related to trips made by commuters, such as the time, date, frequency, fares. The historical commuting data can be used to make prediction on future trips that will be made by the commuters.

[0055] In the following description, the term “historical funding values” refers to data related to funding values topped up on prepaid cards by cardholders in previous top-up processes.

[0056] In the following description, the term “card data” refers to any data stored on the prepaid card which is specific to the prepaid card and/or cardholder.

[0057] In the following description, the term “reward account” refers to an account that holds one or more rewards redeemable for funding the prepaid card. For example, the commuter may use a particular transport service frequently and loyalty points are collected as a result. The loyalty points can be converted to earn free trips or to monetary value for funding the fare card.

[0058] In the following description, the term “authentication input” refers to an input provided by a cardholder of the prepaid card to prove the identity of the cardholder.

[0059] In the following description, the term “cardholder authentication” refers to a process of authenticating an identity of the cardholder.

### Exemplary Embodiments

[0060] Embodiments of the present invention 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.

[0061] Figure 1 shows a diagram illustrating a system and method for funding a prepaid card in accordance with an example embodiment. Figure 1 is explained with respect to a scenario where a commuter makes a request to top-up a fare card at a train station.

[0062] The system includes a terminal of the station. In an embodiment, the terminal is an entrance gantry 102 (hereinafter referred to as “gantry 102”) of the station. It should be noted that the gantry 102 described in the following description is not a top-up machine or kiosk installed in a train station mainly to allow commuters to top-up their fare cards. The gantry 102 is an entry point to gain access to the train and includes a card reader 104 for reading card data from the fare card which is tapped on the card reader 104. The gantry 102 also, optionally, includes a display screen 106 that can display information such as card balance and allows user input such as text input or touch screen gestures. The card reader 104 and display screen 106 at the gantry 102 may be a single hardware unit that perform functions of both the card reader 104 and display screen 106.

[0063] The system further includes a database 108. The database 108 stores data such as cardholder details, funding data and prepaid card details. The system also includes a computer module 110. The computer module 110 is communicatively coupled with the gantry 102 (indicated as part “A” in Figure 1), the database 108 (indicated as part “B” in Figure 1) and a payment network 112 (indicated as part “C” in Figure 1).

[0064] In an embodiment, the commuter taps the fare card on the card reader 104 of the gantry 102 to request access to board the train. The card data stored in the fare card is read by the card reader 104. The card data read from the fare card is transmitted from the gantry 102 to the computer module 104. The computer module 104 retrieves

balance details associated with the fare card from the database 108 based on the card data to determine whether the fare card needs to be topped up. It should be noted that the details of the prepaid card may be stored on the fare card itself, instead of the database 108. For example, the balance details can be read by the card reader 104 from the fare card itself.

[0065] If the balance is sufficient to make fare payments, the balance details are transmitted to the gantry 102 for display on the display screen 106 and the gantry 102 is opened for the commuter to enter. If the balance is insufficient, the gantry 102 will prompt the commuter to top-up the value of the fare card. For example, the display screen 106 displays a question to ask the commuter whether the commuter wishes to top-up the value of the fare card and request for an input (i.e. "Yes" or "No"). It should be noted that the commuter may be prompted to top-up the fare card even if the balance of the fare card is sufficient. In another embodiment, the commuter may request for the top-up process to be initiated automatically if the balance on the fare card is below a predetermined value.

[0066] If the commuter agrees to top-up the value on the card, the display screen 106 further requests the commuter to provide an authentication input using the display screen 106. An example of the authentication input includes a password. The password is transmitted to the computer module 110 for cardholder authentication. Specifically, the computer module 110 retrieves a password associated with the fare card from the database 108. The password received from the gantry 102 is compared with the password retrieved from the database 108 and the top-up process can proceed if the passwords match with each other.

[0067] It should be noted that, instead of a password, commuters may be required to provide other forms of authentication input. For example, a QR code may be sent to a mobile device registered under the cardholder. The commuter is required to scan the QR code displayed on the mobile device using a QR code reader at the gantry 102. Another example of authentication input is biometric data, such as fingerprint.

[0068] In an embodiment, the computer module 110 retrieves the historical commuting data associated with the fare card from the database 108 and determines a suitable top-up value that needs to be added to the prepaid card for settling the fare. The value

determined may be displayed at the display screen 106 for confirmation by the commuter.

[0069] In the event that there are more than one funding accounts available, the computer module 110 also retrieves the details of the funding accounts from the database 108 based on the card data received from the gantry 102. The options of the funding accounts are then displayed on the display screen 106. The options may include a credit/debit card or digital wallet that has been registered under the fare card or that has been used in a previous top-up. The options may also include using loyalty points stored in a reward account.

[0070] As an alternative to the authentication and selection as described above, the commuter may authenticate himself in a pre-registration to allow the fare card to be topped up automatically using a credit card when the balance on the fare card is lower than a predetermined value. The fare card service provider is communicatively coupled to the payment network 112 (including the acquirer bank, card network and issuer bank) via the computer module 110. Thus, when the balance on the fare card is low, the computer module 110 automatically transmits a request for funding the fare card, including the card details which are retrieved from the database 108, to the payment network 112 for authorising the funding of the fare card.

[0071] Upon authorisation of the request, the authorisation details are transmitted from the payment network 112 to the computer module 110. The computer module 110 communicates with the database 108 to update the fare card details to the new amount after the top-up. The new amount is also communicated to the gantry 102 and displayed on the display screen 106 of the gantry 102. A receipt, including the new amount, may be sent to the mobile device number registered with the fare card. The fare card will have sufficient value for a train ride after the top-up and the gantry 102 then opens to let the commuter in.

[0072] It should be noted that the terminal may include the function that allow the cardholder to input funding data of a funding account. The funding data received at the terminal will be stored in the database 108, such that the funding account is usable to top-up the value of the prepaid card.

[0073] Further, it should be noted that, instead of entrance gantry, the terminal may be other types of machine. For example, the terminal can be an exit gantry at the train station. When the commuter taps out at the exit gantry, the fare that is payable by the commuter can be calculated based on the departing and arriving stations and the fare card is then topped up appropriately, e.g. based on historical funding values, historical commuting data, etc. In another example, the terminal can be a stand-alone top-up machine. In any case, since the fare card is linked to one or more funding accounts, the terminal may advantageously allow topping up the fare card without the commuters providing funding data of the funding account.

[0074] In addition to a physical fare card, the fare card may be a virtual card that is stored in a commuter electronic device. For example, a QR code stored in a mobile application installed in the electronic device may be used as a virtual card. The card reader 104 at the gantry 102 may include a QR code reader that can read the virtual card from the electronic device. Since the prepaid card details are stored in the database 108, the activities completed using the physical fare card can be synchronized with that using the virtual card and vice versa. For example, the balance details of the cards are updated when any of the cards is used.

[0075] Embodiments of the present invention provide systems and methods for funding a prepaid card. The data of funding accounts may be stored in the database 108 and can be retrieved when a request for funding the prepaid card is received. As a result, the data of a funding account is not required in a top-up process. Further, the value for funding the fare card may be suggested on the display screen 106 during the top-up process. The options may include the most frequent top-up value, the fare of the most frequent/recent trip, a maximum fare payable, etc. The commuter may also pre-select the funding account and the funding value so that the process of topping up the fare card can automatically occur without any input from the commuter. Thus, the process of funding the prepaid card becomes easier.

[0076] In an alternative embodiment, the top-up process can be integrated with a payment process, for e.g. at the gantry of a train station or a point-of-sale terminal. For example, the entrance and exit gantries are communicatively coupled to the computer module 110 and the fare payable by the commuter can be determined and topped up on the fare card automatically. This may eliminate the need to queue up at a top-up

machine or a counter to top-up the prepaid card, thus providing a better user experience.

[0077] Further, the identity of the cardholder may be authenticated in the top-up process. The commuter may have to provide an authentication input such as a password. Even if there is no display screen at the gantry 102, a QR code may be sent to the cardholder at the mobile device number registered to the cardholder details and the commuter has to scan the QR code in order to proceed with the top-up process. The authentication of the cardholder's identity may provide security to the top-up process.

[0078] Figure 2 shows a flow chart illustrating a method for funding a prepaid card according to an example embodiment. In one implementation, a commuter taps a prepaid card at a terminal of a train station. Card data stored on the prepaid card is read by a card reader of the terminal. Card data may include a serial number or cardholder identifier which is specific to the prepaid card and/or cardholder. At step 202, card data stored on the prepaid card is received by a computer module or server from the terminal. At step 204, it is determined whether the prepaid card needs to be funded. For example, the prepaid card may need to be funded if a balance on the prepaid card is below a predetermined value. At step 206, if the prepaid card needs to be funded, funding data and historical data associated with the prepaid card are retrieved from a database based on the received card data. Funding data may include data of a financial account associated with the prepaid card which can be used to fund the prepaid card. At step 208, a funding value for funding the prepaid card is determined based on the historical data. For example, the funding value may be determined based on the historical commuting data or historical funding values. At step 210, the funding of the prepaid card is authorised using the retrieved funding data and the determined funding value. Optionally, a confirmation may be provided to the commuter in the form of e.g. a visual indicator, an audio message, a display, etc.

[0079] Figure 3 shows a flow chart illustrating a method for funding a prepaid card according to a further example embodiment. In one implementation, a commuter taps a prepaid card at an entrance terminal of a departing station. Card data stored on the prepaid card is read by a card reader of the entrance terminal. Card data may include a serial number or cardholder identifier which is specific to the prepaid card and/or cardholder. At step 302, card data stored on the prepaid card and information of the departing station are received by a computer module or server from the entrance

terminal. The commuter proceeds to take a train. When the commuter alights at an arriving station and taps the prepaid card at an exit terminal of the arriving station, card data stored on the prepaid card is read by a card reader of the exit terminal. At step 304, card data stored on the prepaid card and information of the arriving station are received by the computer module or server from the exit terminal. At step 306, a fare payable is determined based on information of the departing and arriving stations. At step 308, it is determined whether the prepaid card needs to be funded. For example, the prepaid card may need to be funded if a balance on the prepaid card is below a predetermined value. At step 310, if the prepaid card needs to be funded, funding data associated with the prepaid card is retrieved from a database based on the received card data. Funding data may include data of a financial account associated with the prepaid card which can be used to fund the prepaid card. At step 312, the funding of the prepaid card is authorised using the retrieved funding data and the determined fare. Optionally, a confirmation may be provided to the commuter in the form of e.g. a visual indicator, an audio message, a display, etc.

[0080] Figure 4 depicts an exemplary computing device 400, hereinafter interchangeably referred to as a computer system 400, where one or more such computing devices 400 may be used in funding a prepaid card (e.g. to realise the computer module 110). The following description of the computing device 400 is provided by way of example only and is not intended to be limiting.

[0081] As shown in Figure 4, the example computing device 400 includes a processor 404 for executing software routines. Although a single processor is shown for the sake of clarity, the computing device 400 may also include a multi-processor system. The processor 404 is connected to a communication infrastructure 406 for communication with other components of the computing device 400. The communication infrastructure 406 may include, for example, a communications bus, cross-bar, or network.

[0082] The software routines, or computer programs, may be stored in memory and be executable by the processor to cause the computer system 400 to: (A) receive, from a terminal, card data stored on the prepaid card; (B) determine whether the prepaid card needs to be funded; (C) if the prepaid card needs to be funded, retrieve, based on the received card data, funding data and historical data associated with the prepaid card from a database; (D) determine a funding value for funding the prepaid card based on the historical data; (E) authorise the funding of the prepaid card using the retrieved

funding data and the determined funding value. The software routines or computer programs may also comprise steps executable by the processor to cause the computer system 400 to perform the various other analytical steps (e.g. receiving, from the terminal, funding data of at least one funding account; storing the funding data at the database, such that the funding data is retrievable for funding the prepaid card; receiving, from the terminal, a selection of the funding account to fund the prepaid card; retrieving the funding data from the database based on the selection of the funding account; retrieving historical data comprising historical commuting data associated with the prepaid card from the database; determining the funding value for funding the prepaid card based on the historical commuting data; retrieving historical data comprising historical funding values associated with the prepaid card from the database; determining the funding value for funding the prepaid card based on the historical funding values).

[0083] The computing device 400 further includes a main memory 408, such as a random access memory (RAM), and a secondary memory 410. The secondary memory 410 may include, for example, a hard disk drive 412 and/or a removable storage drive 414, which may include a floppy disk drive, a magnetic tape drive, an optical disk drive, or the like. The removable storage drive 414 reads from and/or writes to a removable storage unit 418 in a well-known manner. The removable storage unit 418 may include a floppy disk, magnetic tape, optical disk, or the like, which is read by and written to by removable storage drive 414. As will be appreciated by persons skilled in the relevant art(s), the removable storage unit 418 includes a computer readable storage medium having stored therein computer executable program code instructions and/or data.

[0084] In an alternative implementation, the secondary memory 410 may additionally or alternatively include other similar means for allowing computer programs or other instructions to be loaded into the computing device 400. Such means can include, for example, a removable storage unit 422 and an interface 420. Examples of a removable storage unit 422 and interface 420 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, and other removable storage units 422 and interfaces 420 which allow software and data to be transferred from the removable storage unit 422 to the computer system 400.

[0085] The computing device 400 also includes at least one communication interface 424. The communication interface 424 allows software and data to be transferred between computing device 400 and external devices via a communication path 426. In various embodiments, the communication interface 424 permits data to be transferred between the computing device 400 and a data communication network, such as a public data or private data communication network. The communication interface 424 may be used to exchange data between different computing devices 400 which such computing devices 400 form part an interconnected computer network. Examples of a communication interface 424 can include a modem, a network interface (such as an Ethernet card), a communication port, an antenna with associated circuitry and the like. The communication interface 424 may be wired or may be wireless. Software and data transferred via the communication interface 424 are in the form of signals which can be electronic, electromagnetic, optical, or other signals capable of being received by communication interface 424. These signals are provided to the communication interface via the communication path 426.

[0086] As shown in Figure 4, the computing device 400 further includes a display interface 402 which performs operations for rendering images to an associated display 430 and an audio interface 432 for performing operations for playing audio content via associated speaker(s) 434.

[0087] As used herein, the term "computer program product" may refer, in part, to removable storage unit 418, removable storage unit 422, a hard disk installed in hard disk drive 412, or a carrier wave carrying software over communication path 426 (wireless link or cable) to communication interface 424. Computer readable storage media refers to any non-transitory tangible storage medium that provides recorded instructions and/or data to the computing device 400 for execution and/or processing. Examples of such storage media include floppy disks, magnetic tape, CD-ROM, DVD, Blu-ray™ Disc, a hard disk drive, a ROM or integrated circuit, USB memory, 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 400. 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 400 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.

[0088] The computer program product may store instructions executable by the processor to cause the computer system 400 to: (A) receive, from a terminal, card data stored on the prepaid card; (B) determine whether the prepaid card needs to be funded; (C) if the prepaid card needs to be funded, retrieve, based on the received card data, funding data and historical data associated with the prepaid card from a database; (D) determine a funding value for funding the prepaid card based on the historical data; and (E) authorise the funding of the prepaid card using the retrieved funding data and the determined funding value. The computer program product may also comprise steps which, when executed by the processor, cause the computer system 400 to perform the various other analytical steps (e.g. receiving, from the terminal, funding data of at least one funding account; storing the funding data at the database, such that the funding data is retrievable for funding the prepaid card; receiving, from the terminal, a selection of the funding account to fund the prepaid card; retrieving the funding data from the database based on the selection of the funding account; retrieving historical data comprising historical commuting data associated with the prepaid card from the database; determining the funding value for funding the prepaid card based on the historical commuting data; retrieving historical data comprising historical funding values associated with the prepaid card from the database; determining the funding value for funding the prepaid card based on the historical funding values).

[0089] The computer programs (also called computer program code) are stored in main memory 408 and/or secondary memory 410. Computer programs can also be received via the communication interface 424. Such computer programs, when executed, enable the computing device 400 to perform one or more features of embodiments discussed herein. In various embodiments, the computer programs, when executed, enable the processor 404 to perform features of the above-described embodiments. Accordingly, such computer programs represent controllers of the computer system 400.

[0090] Software may be stored in a computer program product and loaded into the computing device 400 using the removable storage drive 414, the hard disk drive 412, or the interface 420. Alternatively, the computer program product may be downloaded to the computer system 400 over the communications path 426. The software, when

executed by the processor 404, causes the computing device 400 to perform functions of embodiments described herein.

[0091] It is to be understood that the embodiment of Figure 4 is presented merely by way of example. Therefore, in some embodiments one or more features of the computing device 400 may be omitted. Also, in some embodiments, one or more features of the computing device 400 may be combined together. Additionally, in some embodiments, one or more features of the computing device 400 may be split into one or more component parts

[0092] In an implementation, the computer module 110 may be generally described as a physical device comprising at least one processor and at least one memory including computer program code. The at least one memory and the computer program code are configured to, with the at least one processor, cause the physical device to perform the requisite operations.

[0093] Some portions of the description which follows 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.

[0094] Unless specifically stated otherwise, and as apparent from the following, it will be appreciated that throughout the present specification, discussions utilizing terms such as “receiving”, “retrieving”, “authorising”, “storing”, “determining”, 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.

[0095] 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 will appear from the description below.

[0096] 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.

[0097] 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.

[0098] 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 system for funding a prepaid card, comprising:
  - a database; and
  - a computer module in communication with the database and a terminal, wherein the terminal is configured to read card data stored on the prepaid card, and wherein the computer module is configured to:
    - receive, from the terminal, card data stored on the prepaid card;
    - determine whether the prepaid card needs to be funded;
    - if the prepaid card needs to be funded, retrieve, based on the received card data, funding data and historical data associated with the prepaid card from the database;
    - determine a funding value for funding the prepaid card based on the historical data; and
    - authorise the funding of the prepaid card using the retrieved funding data and the determined funding value.
2. The system as claimed in claim 1, wherein the computer module is further configured to:
  - receive, from the terminal, funding data of at least one funding account; and
  - store the funding data at the database, such that the funding data is retrievable for funding the prepaid card.
3. The system as claimed in claim 2, wherein the computer module is further configured to:
  - receive, from the terminal, a selection of the funding account to fund the prepaid card; and
  - retrieve the funding data from the database based on the selection of the funding account.
4. The system as claimed in claim 3, wherein the funding account comprises a reward account for holding one or more rewards redeemable for funding the prepaid card.
5. The system as claimed in claim 3, wherein the funding account comprises one of the following: a bank account, an online payment account, a credit card account, a debit card account and a digital wallet account.

6. The system as claimed in any one of the preceding claims, wherein the computer module is further configured to retrieve historical data comprising historical commuting data associated with the prepaid card from the database; and  
determine the funding value for funding the prepaid card based on the historical commuting data.
7. The system as claimed in any one of claims 1 to 5, wherein the computer module is further configured to retrieve historical data comprising historical funding values associated with the prepaid card from the database; and  
determine the funding value for funding the prepaid card based on the historical funding values.
8. The system as claimed in any one of the preceding claims, wherein the computer module is further configured to process an authentication input from a cardholder of the prepaid card to authorise the funding of the prepaid card.
9. The system as claimed in any one of the preceding claims, wherein the computer module is further configured to transmit the funding data retrieved from the database to a payment network to authorise the funding of the prepaid card.
10. The system as claimed in any one of the preceding claims, wherein the computer module is further configured to retrieve balance details associated with the prepaid card based on the received card data to determine whether the prepaid card needs to be funded.
11. The system as claimed in any one of the preceding claims, wherein the computer module is further configured to:  
display, at the terminal, a confirmation message after determining that the prepaid card needs to be funded; and  
retrieve funding data associated with the prepaid card after receiving a cardholder response to the confirmation message.
12. A method for funding a prepaid card, the method comprising the steps of:  
receiving, from a terminal, card data stored on the prepaid card;  
determining whether the prepaid card needs to be funded;

if the prepaid card needs to be funded, retrieving, based on the received card data, funding data and historical data associated with the prepaid card from a database; determining a funding value for funding the prepaid card based on the historical data; and

authorising the funding of the prepaid card using the retrieved funding data and the determined funding value.

13. A system for funding a prepaid card, comprising:

a database; and

a computer module in communication with the database, an entrance terminal and an exit terminal, wherein the entrance and exit terminals are configured to read card data stored on the prepaid card, and wherein the computer module is configured to:

receive, from the entrance terminal, card data stored on the prepaid card and information of a departing station;

receive, from the exit terminal, card data stored on the prepaid card and information of an arriving station;

determine a fare payable based on information of the departing and arriving stations;

determine whether the prepaid card needs to be funded;

if the prepaid card needs to be funded, retrieve, based on the received card data, funding data associated with the prepaid card from the database; and

authorise the funding of the prepaid card using the retrieved funding data and the determined fare.

14. The system as claimed in claim 13, wherein the computer module is further configured to:

receive funding data of at least one funding account; and

store the funding data at the database, such that the funding data is retrievable for funding the prepaid card.

15. The system as claimed in claim 14, wherein the computer module is further configured to:

receive a selection of the funding account to fund the prepaid card; and

retrieve the funding data from the database based on the selection of the funding account.

16. The system as claimed in claim 15, wherein the funding account comprises a reward account for holding one or more rewards redeemable for funding the prepaid card.

17. The system as claimed in claim 15, wherein the funding account comprises one of the following: a bank account, an online payment account, a credit card account, a debit card account and a digital wallet account.

18. The system as claimed in any one of the claims 13 to 17, wherein the computer module is further configured to process an authentication input from a cardholder of the prepaid card to authorise the funding of the prepaid card.

19. The system as claimed in any one of claims 13 to 18, wherein the computer module is further configured to transmit the funding data retrieved from the database to a payment network to authorise the funding of the prepaid card.

20. A method for funding a prepaid card, the method comprising the steps of:  
receiving, from an entrance terminal, card data stored on the prepaid card and information of a departing station;  
receiving, from an exit terminal, card data stored on the prepaid card and information of an arriving station;  
determining a fare payable based on information of the departing and arriving stations;  
determining whether the prepaid card needs to be funded;  
if the prepaid card needs to be funded, retrieving, based on the received card data, funding data associated with the prepaid card from a database; and  
authorising the funding of the prepaid card using the retrieved funding data and the determined fare.