TITLE

Credit Provision System and Method

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to systems and method for providing credit facilities within a communications network. In particular although not exclusively the present invention relates to the provision of airtime recharge services within mobile communication networks.

Discussion of the Background Art

Most mobile communications systems at present employ two charging paradigms, post-paid and pre-paid. Most post-paid mobile phone services are provided via a contract between the user and a service provider. Under the post-paid paradigm the user is billed at the end of each billing cycle based on their level of usage.

Under the pre-paid paradigms, the user typically purchase the handset along with a set amount of network credit, the user is then free to access the network until they run out of credit. A user may add more credit to the pre-paid account at any time this is known as "topping up" the account. This top up can be affected by a credit/debit card transaction with the provider or by purchasing a "top-up card" at a retail outlet. The top-up card is stamped with a unique code (often under a scratch-off panel) which can be redeemed on the phone for credit. Credit for a pre-paid mobile phone may have a time limit, for example 90 days from the date the last credit was added. In these cases, customers who do not add more credit before expiration will lose their remaining balance, and the service (and its associated phone number) may be discontinued.

One problem with the use of pre-paid mobiles is the difficulty in recharging credit when the user is outside their service provider's network (e.g. user is roaming internationally). In such instances users are unable to purchase recharges cards

from their particular service provider. However, as mentioned above, the user has the option to recharge credit by utilising credit or debit cards, typically this recharge facility is provided in the form of a web portal, dial in service via a pre-programmed service number or SMS service. The dial in and SMS recharge can be problematical particular if the user has insufficient credit to initiate the call or send the SMS. Likewise the web portal requires the user to be able to access the internet, consequently there maybe significant delays between being notified of lack of credit and recharge during which the user is unable to access the network and in some instances unable to receive calls. The delays can be further exacerbated as the user's home network takes some time to register the update in credit values, further delays can occur as the change in credit values is propagated through to the host network.

Accordingly there is a need for a system and method that would allow for the recharge of mobile credit for a mobile subscriber across multiple mobile service provider platforms that is relatively simple to use and seamless. It would also be advantageous to provide a system and method that not only allows recharging of mobile airtime but also enables the recharge credit to be utilised to purchase additional services or goods.

SUMMARY OF THE INVENTION

Disclosure of the Invention

In one aspect of the present invention there is provided a system for providing credit to a subscriber, said system including:

a plurality of networks each of said networks supporting a plurality of subscribers;

a central settlement facility coupled to each network within the plurality of networks, said settlement facility maintaining a plurality of subscriber accounts and wherein the settlement facility is adapted, on receipt of request for credit from a subscriber, to:

convert the request for credit to an intermediate value;

obtain value credit from a credit provider with said intermediate;

credit the subscriber's account in the amount of the requested credit; and advise the subscriber of the approval of the request for credit.

The settlement facility may include at least one server, said server being adapted to maintain the subscriber accounts and negotiate the provision of credit from a plurality of credit providers to one or more subscribers.

The settlement facility may be coupled to a foreign exchange trading service to allow conversion of the credit request to the intermediate value. Preferably the requested amount of credit is transmitted to the settlement facility in the local currency of the network from which the subscriber makes the request. Suitably the intermediate value is the US dollar equivalent of the requested amount of credit. It will be appreciated by those of ordinary skill that the settlement facility may be provided with access to foreign exchange systems (forex) and as such would be capable of selecting multiple currencies for use as the intermediate value. The requested credit amount may be transmitted to the settlement facility by the subscriber via a web portal, SMS, WAP, ODP or USSD command.

The advice regarding approval of the request for credit may be sent to the subscriber in the form of an email, SMS, MMS or the like. Suitably the approval notice includes the amount of credit deposited into the subscriber's account and the amount charged to the subscriber for obtaining the requested amount of credit. Preferably the subscriber is charged for the provision of credit by direct debit to the subscriber's financial institution.

The request for credit may include providing a cash payment for predetermined credit value to a third party, in such instances the system maybe configured to transfer credit between the subscriber's account and the third party's subscriber account e.g. third party acts as credit provider. Alternatively the system may be configured to allow the third party broker the request for credit with the credit provider to obtain the best rate for the subscriber. The system may be configured to credit the third party with a predetermined commission for brokering the provision of credit for the subscriber.

Preferably the credit obtained by the subscriber can be exchanged through the settlement facility for a number of goods and services offered buy one or more third parties registered with the credit facility.

In addition the settlement facility may be adapted to obtain information on the location of the subscriber making the request for credit. The settlement facility may also be configured to calculate the appropriate local and international taxes due of the transaction and adjust the sales price, remittance to a seller (i.e. commission) accordingly.

In a further aspect of the present invention there is provided a system for providing airtime to a subscriber said system including:

a plurality of networks each of said networks supporting a plurality of subscribers;

a central settlement facility coupled to each network within the plurality of networks, said settlement facility maintaining a plurality of subscriber accounts and wherein the settlement facility is adapted, on receiving a request for additional airtime for from a subscriber on a first network, to:

convert the request for airtime to an intermediate value;

obtain airtime form a second network with said intermediate value;

credit the subscriber with the requested amount of airtime; and

advise the subscriber of the approval of the airtime request.

Preferably each of the networks is a mobile communications network, wherein each mobile network may be owned by different mobile service provider. In such instances the subscribers may include mobile subscribers, mobile dealers and retailers of mobile services.

Suitably the first network is the network currently hosting the subscriber and the second network is the subscriber's home network. Alternatively the first and second network may be the same network (i.e. domestic airtime transfer).

The settlement facility may be coupled to a foreign exchange trading service, to allow for the conversion of the airtime request to the intermediate value. Preferably the airtime request is transmitted to the settlement facility in the local currency of the first network. Suitably the intermediate value is the cost in US dollars of the requested amount of airtime. The airtime request may be transmitted to the settlement facility by the subscriber via a web portal, or via a mobile handset in the form of an SMS, WAP, ODP or USSD command. Where the airtime request is transmitted via a mobile handset, the handset may be adapted to provide a set of functional menus to allow the user to input the relevant details of the request including account id, amount of airtime requested etc.

The subscriber may be a post-paid customer of the second network. Suitably the system is configured to debit the subscriber's post-paid account on the second network in the local currency of the second network for the requested amount of airtime. The advice regarding approval of the request for airtime is sent to the subscriber in the form of an email, SMS, MMS or the like. Suitably the notification includes advice on the amount billed to the subscriber's post-paid account for the provision of the requested airtime.

The subscriber may be a pre-paid customer of the second network. In such an instance the request for airtime includes providing a cash payment to debit the third party's subscriber account in the amount of the cash payment, and credit the subscriber's pre-paid account in the amount of the cash payment in the local currency of the network on which the pre-paid account is maintained. The advice regarding approval of the request for airtime is sent to the subscriber in the form of an email, SMS, MMS or the like. Suitably the notification includes advice on the amount in the local currency of the subscriber's home network the amount of airtime credited to the subscriber's account.

The system may also be adapted to allow the transfer of airtime between subscribers. The transfer of airtime between subscribers may initiated by sending a keyword or USSD command to the settlement facility. The party initiating the transfer may then be required to enter the recipient's mobile number and the amount of

airtime the initiating party wishes to transfer to the intended recipient. The system may be further configured to debit the initiating party's home network billing system and to credit the airtime to the recipient's home billing system.

The system may be adapted to provide a predetermine commission to mobile service provider based on the sale made by mobile dealers and mobile retailers. The system may also provide a predetermine commission to mobile dealers for each sale made to a mobile retailer. Suitably the predetermine commission on each transaction is negotiated by each of the mobile service providers registered with the credit facility.

The system may be adapted to obtain information on the location of the subscriber making the request for additional airtime or transfer of airtime.

In a further aspect of the present invention there is provided a method of facilitating the provision of credit to a selected subscriber via central settlement facility coupled to a plurality of networks, wherein each of said networks supports a plurality of subscribers said method including the steps of:

receiving at a central settlement facility a request for credit from at least one subscriber;

determining if the subscriber has an account with the credit facility;

converting the request for credit to an intermediate value on determining that the subscriber maintains an account with the credit facility;

obtaining credit from a credit provider based on the intermediate value;

crediting the subscriber's account with the settlement facility in the amount of requested credit; and

advising the subscriber of the approval of the request for credit.

Suitably the step of receiving includes receiving a keyword, SMS or USSD command in advance of receiving the request for credit.

The step of converting to an intermediate value may include converting the request for credit to an equivalent US dollar amount. Suitably the conversion is performed on the basis of the prevailing forex rates which can be stored within the system.

Preferably the step of obtaining credit includes debiting the credit providers account on the settlement facility in the amount of the request for credit and billing the subscriber's home network service account. Suitably the step of billing the subscriber's home network service account includes converting the intermediate value to the local currency of the subscriber's home network.

The method may further include the step of exchanging the credit contained in a subscriber's account for goods and service provided by third parties registered with the credit facility.

Suitably the step of advising includes sending an electronic notification to the subscriber. The electronic notification may be an SMS, email, MMS or the like. The notification may include information on the amount of credit obtained and the amount billed to the subscriber's home service account for provision of the requested amount of credit.

In a yet another aspect of the present invention there is provided A method of providing airtime to a subscriber of a mobile communications network a central settlement facility coupled to plurality of mobile communications networks said method including the steps of:

receiving at a central settlement facility from at least one subscriber on a first network for a request airtime from a second network within the plurality of networks;

determining if the subscriber has an account with the credit facility;

converting the request for credit to an intermediate value on determining that the subscriber maintains an account with the credit facility;

obtaining based on the intermediate value credit from a credit provider;

crediting the subscriber's account with the settlement facility in the amount of requested credit; and

advising the subscriber of the approval of the request for credit.

Suitably the step of receiving includes receiving a keyword, SMS or USSD command in advance of receiving the request for airtime.

Preferably the first network is the network currently hosting the subscriber and the second network is the subscriber's home network. The first and second network may be the subscriber's home network.

The request for airtime may be in local currency of the first network, and the step of converting to an intermediate value may include converting the request for airtime from the first network currency to an equivalent US dollar amount.

The subscriber may be a post-paid customer of the second network, accordingly the method may include the step of debiting the subscribers post-paid account on the second network in the local currency of the second network in the amount of request for airtime.

The subscriber may be a pre-paid customer of the second network. In such an instance the method may include the steps of providing a cash payment to a third party within the first network in a first currency, debiting the third party's subscriber account in the amount of the cash payment, and crediting the subscribers pre-paid account in the amount of the cash payment in the local currency of the subscriber's home network on which the pre-paid account is maintained.

Suitably the step of advising includes sending an electronic notification to the subscriber. The electronic notification may be an SMS, email, MMS or the like. The notification may include information on the amount of credit obtained and the amount billed to the subscriber's home service account for provision of the requested amount of airtime.

BRIEF DETAILS OF THE DRAWINGS

In order that this invention may be more readily understood and put into practical effect, reference will now be made to the accompanying drawings, which illustrate preferred embodiments of the invention, and wherein:

FIG. 1 is a schematic diagram illustrating the transfer of a credit between users of two networks according to one embodiment of the present invention;

FIG. 2 is a schematic diagram illustrating one possible configuration of a credit provision facility according to one embodiment of the present invention

FIG. 3 is a schematic diagram of one process of providing a mobile subscriber according to one embodiment of the present invention;

FIG. 4 depicts one possible structure for a rate card according to one embodiment of the present invention;

FIG. 5 is a schematic diagram illustrating the process steps associated with providing a mobile subscriber with additional credit;

FIG. 6 is a schematic diagram illustrating the relationship between network providers, dealers and retailers according to one embodiment of the present invention;

FIG. 7 is a schematic diagram illustrating the process steps associated with enrolling a network provider on the credit provision system according to one embodiment of the present invention;

FIG. 8 is a schematic diagram illustrating the process steps associated with providing a dealer with credit according to one embodiment of the present invention;

FIG. 9 is a schematic diagram illustrating the process steps associated with providing a retailer with credit according to one embodiment of the present invention

FIG. 10A and 10B are flow charts illustrating the login and change password processes according to one embodiment of the present invention.

FIG. 11 is a schematic diagram illustrating the transfer of airtime between two mobile subscribers according to one embodiment of the present invention;

FIG. 12 is an example of a series of user screens for initiating transfer of airtime from one mobile subscriber to another according to one embodiment of the present invention;

FIG. 13 is a schematic diagram illustrating the process steps associated with the transfer of airtime between mobile subscribers;

FIG. 14 is a schematic diagram represent another possible application environment for the credit provision system according to one embodiment of the present invention; and

FIG. 15 is a schematic diagram illustrating one possible configuration of a credit provision system for the purchasing of goods and services according to one embodiment of the present invention.

DESCRIPTION OF EMBODIMENTS OF THE INVENTION

With reference to Fig 1 there is illustrated an overview of system functionality for the provision of credit to subscribers of the participating communications networks according to one embodiment of the present invention. As shown two networks, network A 101 and network B 102 allow subscribers of network A 103 to roam (roaming subscriber 105) within network B and vice versa (i.e. roaming subscriber 106 in network A).

As is the case with most current pre-paid credit paradigms, subscribers 103, 104 are free to purchase additional airtime from their local retailers 107, 108. Unlike standard pre-paid arrangements, however, the exemplified system in this instance allows for roaming subscribers 105, 106 to purchase additional credit from retailers in the current host network 101, 102. The purchasing of credit outside a subscriber's local network 101, 102 is discussed in greater detail below.

In addition to allowing a subscriber to purchase additional credit outside their local network the system also allows for the transfer of credit between various subscribers. For example if a subscriber purchases a pre-paid service on network A and the subscriber maintains a post-paid service on network B, any leftover airtime on the pre-paid service could be credited back to the subscribers post-paid service via a peer to peer transfer process 108.

To permit subscribers to purchase airtime from their local network via the current host network the system utilises a central credit facility. An example of one possible arrangement of a centralised settlement facility 200 is illustrated in Fig 2. As shown networks A and B 101, 102 are coupled to the settlement facility 200 to permit the transfer of funds associated with a credit request to the Transfer Server 201 of the settlement facility 200.

The Transfer Server (TS) 201 in this instance is an application running on at least one server 202 disposed within the settlement facility 200. The TS 201 is responsible for co-ordinating the purchasing of airtime by various subscribers, retailers and

dealers across both networks. As shown the TS 201 maintains an account for each of the registered users 203a, 203b,...,203n each account contains a settling account 204 information, configuration data 205 and transaction logs 206. The settling accounts 204 may include information relating to the amount of available credit for a given user. Indeed for most individual users the settling account simply contains the amount of available credit, however in the case of dealers and retailers the settling account 204 can contain additional information such as commissions and sales etc (discussed in greater detail below).

The configuration data 205 for each user can include information relating to the network configuration for the particular user, rate card and commissioning scheme etc. The transaction log 206 maintains a log of all transactions for reporting and settlement (system should be able to determine the breakdown or allocation of the transaction amount into sales and commissions)

As illustrated various users (subscribers 105,106, dealers 601a, 601b, and retailers 107,108) can access the settlement facility 200 in a variety of manners. For instance a user could access the settlement facility via web portal 207. Alternatively the user could access the settlement facility 200 via phone 208 keyword, menu, SMS or USSD command. The settlement facility 200 may be coupled to the backend billing systems 209, 210 of network A and network B respectfully. On receiving a request for additional credit the settlement facility 200 passes the request to the TS 201 which then processes the request. The appropriate credit value in the user's settling account is adjusted accordingly and bills the user via their home network billing system 209, 210.

As shown in Fig 2 the settlement facility has access to foreign currency facilities 211. This enables the system to convert the requested amount of credit to a common base rate before forwarding the requested credit value to TS 201 for processing. The manner in which the credit request is processed is discussed in greater detail below.

Fig 3 depicts one example of how the settlement facility 200 can be utilised to effect airtime recharge for a roaming subscriber 105,106 in a host network. As shown the

subscriber 105 purchases additional airtime from a retailer 108 with host network 102. The retailer then forwards the purchase request to the settlement facility 200.

In this particular example, the subscriber 105 request $HK40 in additional credit. This value is then forwarded to the settlement facility 200. The settlement facility then converts the cash value to an e-value via an Electronic Value Transaction (EVT). In the present example, the EVT involves the conversion of the $HK40 to an equivalent US dollar amount. The US dollar amount can then be equated to an equivalent load denomination offered on the subscriber's home network by the TS 201. The load denominations offered are determined by the relevant networks party to the partnering agreement. These values are stored in a standard rate card. An example of the rate card is shown in Fig 4, as shown the rate card lists the minimum load denominations in USD and the applicable currencies of the member networks. The minimum denominations are set in accordance with the Standard Retail Price (SRP) for airtime (in local currency) of each of the participating networks. The SRP is comprised of the Rate Card Cost (Electronic Value equivalent of the airtime being sold, which is inclusive of any applicable tax such as VAT) and the Mark-up (which serves as the Retailer's earnings).

Once the TS 201 has determined the load denomination, it proceeds to debit the retailer's settling account 301 in the amount of credit purchased by the subscriber 105 and credits the users home network settling account 302 the amount of credit purchased in the home networks local currency based on the values contained in the rate card. The home network 101 then updates the subscriber's airtime credit 303 based on the received funds and sends back an SMS acknowledgement to the retailer and subscriber 304 of the successful completion of the transaction.

A more detailed view of the process of the inter-network purchasing of additional credit is shown in Fig 5. Here the subscriber buys airtime from a host network retailer 108; the retailer 108 then sends a load airtime transaction request 501 to the TS 201. On receipt of the request the TS 201 performs a validation 502 to determine if the retailer 108 is a validly registered user. At this stage the TS 201 also determines whether the transfer is a domestic or international transfer and whether

the retailer is transacting within the host network's country. Once the validation step is complete the TS 201 then proceeds to retrieve the available denominations and their Standard Retail Price 503. The retrieved denomination is calculated by the TS 201 converting the requested denomination for load into the conversion rate based on the rate card table (see Fig 4) plus any local taxes applicable. The TS 201 then advises the retailer 108 of the available denominations 504. The retailer then selects the appropriate denomination and sends confirmation 505 to the TS 201.

On receipt of the confirmation the TS 201 then validates the request 506. If the request is valid then the system then computes the converted cost 507 (converted cost = denomination cost x conversion rate). The TS 201 then reviews the retailer's settling account to ensure they have sufficient credit to enable the transaction 508. If there is sufficient credit to enable the transaction the TS 201 proceeds to debit the retailer's settling account 509. The TS 201 then sends the reload request 510 to the subscriber's home network billing system 210. The billing system 210 then credits the subscriber's airtime allocation with the received load denomination 511 and sends a response back to the TS 201 signalling the successful update 512. A notification is then set to the subscriber 513 and the retailer 514 advising them of successful completion of the reload operation.

Once the reload is effected, the TS 201 then proceeds to compute the commissions for the dealer through which the retailer purchases credit and the commission for the host network 515. The dealer commission is calculated on the basis of the converted cost multiplied by the agreed commission rate and dealer's share. Likewise the host network commission is calculated on the basis of the converted cost multiplied by the agreed commission rate and host network's share. Once the commissions are calculated the TS 201 proceeds to credit the dealer's and host network's settling accounts 516 with the appropriate amounts. Once this is complete the TS 201 then proceeds to calculate the sales amount for the subscriber's home network 517 (home network sales = denomination cost x conversion rate – agent network and dealer commissions). The sales value is then credited to the home networks settling account 518.

As can be seen from the above discussion, in order to effect settling of the requested credit value the participating dealers, retailers of the host networks are required to have a level of available credit within their settling accounts to permit sale and transfer of airtime to subscribers.

Typically the dealers purchase credit from their local network provider which inturn is provided with an amount of credit as part of their airtime sales commitment one entry into the partnering agreement. Fig 6 shows this hierarchy of network providers, dealers and retailers. Under the present system, the network providers 101,102 have the ability to enrol dealers 601a, 601b onto the system, modify the dealer profile and remove dealer from the system. Dealers 601a, 601b are able to enrol a number of retailers 107,108 onto to the system, dealers 601a, 601b sell credit to the retails as part of the enrolment process.

Retailers 107, 108 earn money based on the percentage mark up applied to the sale of credit to subscribers, for each sale the retailer makes the enrolling dealer 601a, 601b earns a percentage commission. Network providers 101, 102 then earn a percentage commission on all sales made by dealers to retailers and retailers to subscribers.

Commissions may then be en-cashed by the dealers 601a, 601b and network providers 101, 102. There are a number of commission payment models that may be utilised. For example commissions may paid back on a just in time basis. The commission scheme utilised to effect transfer is determined by the network providers on entry into the partnering agreement.

Fig 7 illustrates the process of crediting a network provider's electronic settling account. Here the provider gives an airtime sales commitment as agreed to in the partnering agreement between the participating networks. The actual value transmitted by the network provider 101,102 is the agreed sales commitment plus the service fee for utilising the settlement facility (preferably in US Dollars). For example if the network provider agrees to a $100 000 sales commitments and the settlement facility has a 2% commission the transfer request would in fact be for $102, 000. The

settlement facility then converts the received transfer request to a US dollar amount and deducts the requite service fee before forwarding the transfer request 702 to the TS 201. The TS 201 then converts the received value back to the local currency of the enrolling network provider based on the exchange rate at the date of the original transfer request 703. The TS 201 then credits the network provider's settling account with a load denomination equivalent to the received value 704 and then sends a notification back to the network provider 705 of the deposit of the load credit.

Fig 8 depicts the transfer of credit between the network provider and an authorised dealer 601a, 601b for the network. Here the dealer 601a, 601b purchases a set amount of credit 801 from the network provider for later resale to the dealer's retail network. The network provider then sends a transfer request 802 to the TS 201. The TS 201 then performs a validation on the sending and receiving parties 803 (i.e. network provider and dealer making purchase). If both parties are validly registered the with the system then the TS 201 proceeds to check if the network provider's settling account has sufficient balance to deliver the requested credit to the dealer 804. If the balance of the network provider's account has sufficient credit then the TS 201 debits the network provider's account 805 and credits the dealers account with the requested amount of credit 806. The TS 201 then sends an SMS message to both parties 807a, 807b of the successful completion of the transfer request.

A similar process is employed for the transfer of credit between the dealer 601a, 601b and retailer 107, 108, as shown in Fig 9. The retailer 107, 108 purchases credit from their specified dealer 601a, 601b. The dealer 601a, 601b sends a transfer request 901 to the TS 201. The TS 201 then proceeds to validate the request 902. During the validation the TS 201 firstly checks if the target account and transfer amount is valid. The TS 201 then proceeds to check if the target (retailer) account is enrolled to the source (dealer) account and if the source account has enough credit. Once it is established that the proposed transaction is valid the TS 201 proceeds to debit the dealer's settling account 903 and credit the retailers settling account 904. Once the transaction is complete, the TS 201 sends a notification 905 to the retailer 107, 108 and to the dealer 601a, 601b.

It should be noted that the transactions between the network provider, dealer and retailer are performed directly with the TS 201 and do not require the settlement facility to perform a conversion to US dollars. As it will no doubt be appreciated by those of ordinary skill in that art as the TS 201 stores the credit values in the home currency of the network then there is no need to perform a currency conversion as all parties in the transactions illustrated in Figs 7 to 9 utilise the same currency.

As briefly mentioned above the TS 201 also maintains a commission and sales accounts as part of the general settling account, which store the commissions conferred and revenues generated by sales to the network service providers, dealers and retailers.

The commissions account is generally only applicable to network providers and dealers as retailers earn revenue through the mark-up they place on the over the counter sale of the load credit. The values stored in the commissioning accounts for various dealers can be en-cashed at a later date. For example the network provider may be provided with the ability deplete the dealer's electronic settlings account for commissions in exchange for cash or load credit.

In such instances the dealer goes to an encashment centre designated by the network provider and requests for redemption of commissions earned. The dealer is presented with the option of taking the commissions in the form of cash or additional load credit. Once the dealer select the desired form of redemption the network provider initiates the transfer by submitting the dealers request to the TS 201, which then checks the dealers commissions account and collates the total commissions payable. The TS 210 then proceeds to check if the network provider has sufficient credit in their settling account to cover the commission payable and if so debits the networks providers account and transfers the appropriate monetary value to an account of the dealer's choice. The TS 201 then proceeds to clear the commissions account of the dealer.

If dealer opts to redeem the commissions in the form of credit the TS 201 checks the network providers account to determine whether they have enough credits to

complete the transaction the TS 201 proceeds to debit the dealer's commissions account and the network service provider's settling account of the corresponding value of load credit, before finally crediting the dealers settling account with the credit value corresponding to the commission earned by the dealer. The TS 201 then notifies both parties of the successful completion of the transaction.

The en-cashing of commissions at the network service provider level differs slightly to that of the en-cashing scheme between dealer and network service provider. In the case of the network service provider the settlement facility performs a sweep of all electronic settling accounts for commissions owed to a particular network service provider. The settlement facility then collates these commissions and deposits them into the relevant network provider's bank account. A similar en-cashing process to that discussed in relation to the redemption commissions owed to a particular network is used to redeem the sales made by a particular network. In this case the settlement facility sweeps the sales account of the relevant network and deposits the appropriate amount into the relevant network provider's bank account.

In addition to the above the system also provides a number of auxiliary functions to the network providers, dealers and retailers are summarised in table 1 below:

Auxiliary Transactions	
Network Provider	
Inquire Balance: Load Credit	This transaction allows the Agent Network to view the current balance of its Electronic Settling Account for Credit Load. ***Transaction Flow*** • Agent Network initiates (via mobile or web) Balance Inquiry transaction for Credit Load and submits transaction. • UTS processes request. • Agent Network receives notification containing balance information.
Inquire Balance: Commissions	This transaction allows the Agent Network to view the current balance of its Electronic Settling Account for Commissions. ***Transaction Flow*** • Agent Network initiates (via mobile or web) Balance Inquiry transaction for Commissions and submits transaction. • UTS processes request. • Agent Network receives notification containing balance information.
Inquire Balance: Sales	This transaction allows the Home Network to view the current balance of its Electronic Settling Account for Sales. ***Transaction Flow***

	• Home Network initiates (via mobile or web) Balance Inquiry transaction for Sales and submits transaction. • UTS processes request. • Home Network receives notification containing balance information.
Dealer	
Inquire Balance: Credit	This transaction allows the Dealer to view the current balance of its Electronic Settling Account for Credit Load. • Follows the same flow as inquire balance for network provider set out above.
Inquire Balance: Commissions	This transaction allows the Dealer to view the current balance of its Electronic Settling Account for Commissions. • Follows the same flow as inquire balance for network provider set out above.
Acct. Management: Set PIN	This transaction allows the Dealer to define a PIN that can be used to protect or 'Lock' the Credit Load Menu. This does not apply to web-based or USSD-based transactions. ***Transaction Flow*** • Dealer selects Set PIN transaction on the Credit Load Menu. • Inputs desired PIN, confirms PIN and submits. • UTS processes request. • Dealer receives a notification for the successful transaction.
Acct. Management: Change PIN	This transaction allows the Dealer to change the current PIN. ***Transaction Flow*** • Dealer selects Change PIN transaction on the Credit Load Menu. • Inputs current PIN, new PIN, confirms new PIN and submits. • UTS processes request. • Dealer receives a notification for the successful transaction.
Acct. Management: Lock/Unlock	This transaction allows the Dealer to Lock or Unlock the Credit Load Menu. Functionalities ▪ Lock hides all options of the Credit Load Menu (e.g. Transfer, Inquire Balance), except Unlock, Change PIN and Call Hotline ▪ Unlock exposes all options of the Credit Load Menu (when previously Locked). PIN entry will be required for this transaction (prerequisite: Dealer has performed Set PIN).
Acct. Management: Call Hotline	This transaction allows the Dealer to initiate a voice call to the assigned after sales group upon selecting the Call Hotline option in the Credit Load Menu.
Retailer	
Inquire Balance: Credit	This transaction allows the Retailer to view the current balance of its Electronic Settling Account for Credit Load. • Follows the same flow and logic as inquire balance for network provider set out above.
Acct. Management: Set PIN	This transaction allows the Retailer to define a PIN that can be used to protect or 'Lock' the Credit Load Menu. This does not apply to web-based or USSD-based transactions. • Follows the same flow and logic as per dealer acct management set pin set out above.
Acct. Management: Change PIN	This transaction allows the Retailer to change the current PIN. • Follows the same flow and logic as set out in dealer change pin set out above.
Acct. Management: Lock/Unlock	This transaction allows the Retailer to Lock or Unlock the Credit Load Menu. Has the same functionalities as described in dealer lock/unlock set out above.
Acct. Management: Call Hotline	This transaction allows the Retailer to initiate a voice call to the assigned after sales group upon selecting the Call Hotline option in the Credit Load Menu.

Table 1: Summary Auxiliary Functions for Account Management on TS

Fig 10 A depicts one possible configuration of a user login process according to one embodiment of the present invention. To initiate login the user enters their assigned user ID and password 1001. The system then determines if the user name and password are valid 1002 if so the system then proceeds to check if this is the user first login 1003. If it s the users first login the system then initiates a change password process which is described in greater detail below (see Fig 10B).

If the user name and password are valid and have been utilised for a previous login, the system proceeds to verify the status of the user's account 1005. If the users account has been blocked, if so the system advises the user that the account is not valid and returns to the to the initial login screen 1006. If the user account status is valid the system the process to verify the users access level 1007 and then open the appropriate home screen with the relevant user options (as set out in table 1 above).

Fig 10B depicts one possible implementation of the change password function. The process is initiated 1009 by the user selecting the change password word button. The system then requests the user to verify their current password, or in the case where it is initial login discussed above the system verifies whether the assigned password is valid 1010. If the password is invalid the system notifies the user and returns to the main user screen 1011.

In the event that the password is valid the system then requests that the user enter the new password 1012. The system then requests that the user to re-enter the new password for verification 1013. Once verified the system updates the password 114, before returning the user to the main user screen 115.

It will be appreciated by those skilled in the art that while the above system has been described in relation to the transfer of credit between networks that the system is equally applicable to the provision of credit within a single network (i.e. wherein the host and home network are the same).

As briefly discussed above, the system also provides subscribers with the ability to transfer airtime charged to a subscriber's post-paid account to a pre-paid account of their choosing or vice versa, via the use of a peer to peer operation 108. Such a transfer scheme is also applicable for the transfer of airtime from one pre-paid subscriber to another pre-paid subscriber. An example of the peer to peer transfer of airtime between subscribers is shown in Fig 11.

In this example a subscriber of network B wishes to transfer airtime to a subscriber in network A. The load airtime transaction is initiated by sending a keyword or USSD command. Once the request is initiated the sending party 1101 inputs the desired recipient's 1104 mobile number and airtime denomination. The request is then sent to the TS 201 processing. The TS 201 then validates the initiating party's and recipient's mobile numbers to determine if they are registered users of the system. If so, the TS 201 debits the initiating party's home network billing system and then credits the airtime to the recipient's home billing system. Both the initiating party and the recipient are then notified of the successful transfer of airtime between the subscribers.

Fig 12 depicts one example of a series of user screens that may be initiated on a subscriber's handset to effect transfer of airtime. As shown the user access the transfer procedure by selecting it from the user option menu 1201. The user is then required to enter the mobile number they wish to transfer airtime to 1202, once the recipient's mobile number has been entered the initiating party is then required to enter the desired transfer amount in the recipient's local currency 1203. To confirm the transfer of the requested amount the initiating party is then required to enter a pre-assigned pin number 1204. Once the transfer is affected the initiating subscriber is then advised of the transfer and the amount billed to their home account.

A more detailed view of the transfer process is depicted in Fig 13 as above the initiating party 1101 sends a transfer request 1301 to the TS 201, which then proceeds to validate the request 1302. During the validation the TS determines the type of transfer requested e.g. post-paid to prepaid etc. Once the TS 201 has

validated the request it proceeds to retrieve the available denominations 1303 and convert the retrieved denominations to the host networks currency 1304. The TS 201 then sends a reply 1305 to the initiating party 1101 advising of the available denominations and the prices associated with each. The initiating party then selects the desired denomination and confirms the transfer 1306.

On receipt of the confirmation the TS 201 then proceeds to calculate a converted value 1307(selected denomination x conversion rate). A request is then sent 1308 (which includes the initiating party's mobile number and the converted value) to the host network billing system 209 which then process the request 1309 and sends a response 1310 to the TS 201. The TS 201 then sends a request 1311 (which includes the recipient's mobile number and the desired denomination) to the recipient's home network billing system 210, which processes the request 1312 and sends a response to the TS 1313. The TS 201 then sends notifications to the initiating party 1314 and the recipient 1315 advising of the successful completion of the transaction.

Once the TS 201 has notified the initiating and receiving parties it then computes the converted cost associated with the transaction 1316 (denomination cost x conversion rate). The TS 201 then proceeds to determine if the host network has sufficient credit 1317 and if so the TS 201 proceeds to deduct the converted cost from the host networks settling account 1318. The system then proceeds to calculate the commissions due to the host network 1319 (denomination cost x conversion cost x commission rate) the calculated commission is then credited to the host networks settling account 1320. Finally the TS 201 calculates the value of sales due to the home network 1321 (denomination cost x conversion rate – commissions) and credits these to the home networks settling account 1322.

Fig 14 illustrates a further possible application of the credit provisioning system according to one embodiment of the present invention, here the system is utilised to purchase various third party goods and services. As shown a consumer 1403 (e.g. a

mobile subscriber, small retail store etc) can access a number of products and services 1405 offered by a number of manufacturers 1401, and third party retailers (lead stores) 1402. In this particular example the credit is exchanged for goods and services as opposed to airtime per the above examples. Consequently the TS 201 not only maintains settling accounts for each user but it is also configured to maintain an inventory of items for sale in the case of manufacturers 1401 and the lead stores 1402 and goods purchased in the case of customers 1403. Accordingly the TS 201 manages the purchasing and settlement. In addition to this the TS 201 is also tied into one or more logistic providers 1404. This enables the system to provide inventory tracking and distribution services between the manufacturers 1401, lead stores 1402 and consumers.

Fig 15 depicts one example of how a purchase may be affected via the TS 201. As shown a consumer 1403 is free to view the various goods and service on offer from manufacturers 1401, and retailers 1402 via an access point 1503 in this instance either a web portal 1501 or mobile network 1502. When the user identifies the item the wish to purchase 1405 they initiate a purchasing request to the TS 201. The purchasing request contains the store identification, the item code and the quantity. The system then checks the stores inventory list contained in their member account to ensure that the item is in stock and if so the system places a purchase order which is saved to the transaction logs of the store and consumer 1505 making the purchase. The store is then notified regarding the pending transaction (email, SMS, MMS etc).

The store then issues a purchase invoice for the transaction. This is then stored in the transaction logs of both the consumer and the issuing store. When the consumer wishes to complete the transaction the system retrieves the purchase invoice and displays it to the consumer for review. If the consumer is satisfied that the details of the purchase are correct they then issue a payment request. On receipt of the payment request the system proceeds to check the consumers settling account to ensure they have sufficient credit to complete the transaction. If the consumer has sufficient credit the system proceeds to debit the consumers settling account in the required amount and credit the stores settling account.

The system then notifies the store of the transfer of credit, the store then issues a purchase receipt. The purchase receipt is then sent back to the consumer to verify successful completion of the transaction. A copy of the purchase receipt is stored in transaction logs of the store and consumer. By maintaining a copy of the receipt within both parties member accounts the system can readily resolve any disputes that may arise over the order etc.

As with the airtime loading system above the trading system allows distributors to sell goods to dealers who in turn are able to sell to the retailers. Indeed the purchasing process that occurs at the service provider end is similar to the purchasing process occurring between the consumer and retailer. For instance a dealer can review the inventory of a various distributors and select the items the wish to purchase from the distributor.

The supply of the goods from the distributor to the dealer can be administered under two possible usage scenarios. Under the first possible supply model the dealer may take the goods on credit. In this instance the dealer is free to select the goods they wish to purchases from the distributor. Once the dealer has made their desired selections they issues a purchase request including the distributor ID, the items for purchase and the quantities of each item required. On receipt of the purchase request the system proceeds to check the dealers inventory account to ensure that the dealer has sufficient stock to fulfil the request. If there is sufficient stock to fulfil the request the distributor is then notified of the pending transaction (email, SMS etc). The distributor issues a purchase invoice for the requested goods, the invoice is then saved to the transaction log of the distributor and dealer. The stock items are then debited from the distributor's inventory list and credited to the dealer's inventory list.

The dealer is then free to on sell the stock items to retailers, the items are on sale at suitable mark up. On sale of the goods to the retailer the dealer's settling account is credited in the sales amount. To effect settlement with the distributor, the dealer sends a request to the system to retrieve the relevant purchase invoice utilising an

access code or keyword associated with the purchase invoice number. The system then checks if the invoice number is valid and then verifies if there is sufficient credit in the dealer's settling account to complete the transaction. If so the system debits the dealer's settling account and credits the distributors settling account. Both the dealer and distributor receive notifications from the system on successful completion of the transaction.

The alternate usage model is that of a commission model. Here the dealer purchases an agreed volume of inventory from the distributor. In this instance, the dealer sends a purchase order including the distributor ID and agreed purchase amount to the system, the system then checks the dealers account to ensure that there is sufficient credit to proceed with the transaction, if so the system proceeds to debit the dealer's settling account and credits the distributor's settling account. The distributor then advises the system of the stock items to transfer from its inventory listing to the dealer's inventory listing. On transfer of the stock items, the system provides the dealer with a listing of the incoming stock. The dealer is then free to sell the stock at the recommend price for each sale. The dealer's settling account is credited by the amount of the recommended sale price set by the distributor. A corresponding entry is also made in the dealer's commissions account in accordance with the agreed commissioning scheme in place between the dealer and the distributor.

The commissions may be redeemed on a periodic basis or at the instigation of the dealer. In the case of a periodic redemption process the system performs a sweep of the dealers account for any unpaid commissions (i.e. values stored in dealers commissions account). The settlement facility then collates these commissions and arranges for transfers of the appropriate funds to be transferred from the relevant distributor's settling account into the dealer's selected bank account. The system then notifies the dealer and the distributor of the transfer.

In the case of a dealer initiated transfer, the dealer sends a transfer request to the system which then verifies whether the dealer and the distributor are validly registered members of the system. If so the system then proceeds to check if the distributors settling account has sufficient funds to affect the transfer of the required

funds to the dealer. In the event that the distributors account contains sufficient credit, the system arranges transfer of the appropriate funds to the dealer's bank account. The system then notifies the distributor and dealer of the transfer.

As shown, the system may also be linked to various financial institutions 1404. This enables the system to en-cash the credit accumulated by retailers, dealers and distributors directly into the account of their choosing. In addition, linking into various financial institutions 1404 provides the consumer with the option to purchase credit directly from the credit facility. For example, a consumer can logon to their account with the settlement facility and request additional credit, the system then debits the selected bank account of the consumer in the amount of the credit request and then updates the amount of available credit in the consumers settling account.

It is to be understood that the above embodiments have been provided only by way of exemplification of this invention, and that further modifications and improvements thereto, as would be apparent to persons skilled in the relevant art, are deemed to fall within the broad scope and ambit of the present invention described herein.

CLAIMS

1. A system for providing credit to a subscriber, said system including:

a plurality of networks, each of said networks supporting a plurality of subscribers;

a settlement facility coupled to each network within the plurality of networks, said settlement facility maintaining a plurality of subscriber accounts and wherein the settlement facility is adapted, on receipt of request for credit from a subscriber, to:

convert the request for credit to an intermediate value;

obtain credit from a credit provider with said intermediate value;

credit an account held by the subscriber on the settlement facility with an amount equivalent to the request for credit; and

advise the subscriber of the approval of the request for credit.

2. The system of claim 1 wherein the settlement facility includes at least one server, said server being adapted to maintain the plurality subscriber accounts and negotiate the provision of credit from the credit provider.

3. The system of claim 1 or 2 wherein the request for credit is transmitted to the settlement facility in the local currency of the network from which the subscriber makes the request.

4. The system of any one of claims 1 to 3 wherein the settlement facility is coupled to a foreign exchange trading service.

5. The system of claim 4 wherein the intermediate value is the US dollar equivalent of the request for credit.

6. The system of any one of claims 1 to 5 wherein the request for credit is transmitted to the settlement facility by the subscriber via a web portal, SMS, WAP, On Device Portal (ODP) or USSD command.

7. The system of any one of claims 1 to 6 wherein the settlement facility contains a central clearing house.

8. The system of claim 1 wherein the request for credit includes providing a cash payment for predetermined credit value to a third party broker having an account with the credit facility.

9. The system of claim 8 wherein the system is configured to transfer credit from the third party broker's account to the subscriber's account.

10. The system of claim 8 wherein the system is configured to allow the third party broker to negotiate the request for credit with the credit provider to obtain the best rate for the subscriber.

11. The system of claim 10 wherein the system is configured to credit the third party broker with a predetermined commission for brokering the provision of credit for the subscriber.

12. The system of claim 8 wherein the system configured to credit the third party with a predetermined commission for the sale of credit to the subscriber.

13. The system of any one of claims 1 to 12 wherein the advice regarding approval of the request for credit is sent in the form of an email, SMS or MMS.

14. The system of claim 13 wherein the advice includes the amount of credit deposited into the subscriber's account and the amount the charged to the subscriber for obtaining the requested amount of credit.

15. The system of any one of 1 to 14 wherein the credit obtained by the subscriber is exchanged through the settlement facility for goods and services offered by one or more third parties registered with the credit facility.

16. A system for providing airtime to a subscriber of a communications service, said system including:

a plurality of networks each of said networks supporting a plurality of subscribers;

a settlement facility coupled to each network within the plurality of networks, said settlement facility maintaining a plurality of subscriber accounts and wherein the settlement facility is adapted, on receiving a request for airtime for from a subscriber on a first network, to:

convert the request for airtime to an intermediate value;

obtain airtime from a second network with said intermediate value;

credit the subscriber with the requested amount of airtime; and

advise the subscriber of the approval of the airtime request.

17. The system of claim 16 wherein the first network is the network currently hosting the subscriber and the second network is the subscriber's home network.

18. The system of claim 16 or 17 wherein the request for airtime is transmitted to the settlement facility in the local currency of the first network.

19. The system of any one of claims 16 to 18 the settlement facility is coupled to a foreign exchange trading service.

20. The system of claim 19 wherein the intermediate value is the US dollar equivalent of the request for airtime.

21. The system of any one of claims 16 to 20 wherein the request for airtime is transmitted to the settlement facility by the subscriber via a web portal, SMS, WAP, On Device Portal (ODP) or USSD command.

22. The system of any one of claims 16 to 21 wherein the subscriber is a post-pay customer of the second network.

23. The system of claim 22 wherein the system is configured to debit the subscribers post-pay account on the second network in the local currency of the second network for the requested airtime.

24. The system of any one of claims 16 to 20 wherein the subscriber is a pre-paid customer of the second network.

25. The system of claim 24 wherein the request for airtime includes providing a cash payment to a third party within the first network in a first currency said third party having a subscriber account with the credit facility.

26. The system of claim 25 wherein the system is configured to debit the third party's subscriber account in the amount of the cash payment, and credit the subscriber's pre-paid account in the amount of the cash payment in the local currency of the network on which the pre-paid account is maintained.

27. The system of any one of claims 15 to 26 wherein the advice regarding approval of the request for credit is sent in the form of an email, SMS or MMS.

28. The system of claim 27 wherein the advice includes the amount of airtime credited to the subscriber's home account.

29. A method of facilitating the provision of credit to a selected subscriber via central settlement facility coupled to a plurality of networks, wherein each of said networks supports a plurality of subscribers said method including the steps of:

receiving at a central settlement facility a request for credit from at least one subscriber;

determining if the subscriber has an account with the credit facility;

converting the request for credit to an intermediate value on determining that the subscriber maintains an account with the credit facility;

obtaining credit from a credit provider based on the intermediate value;

crediting the subscriber's account with the settlement facility in the amount of requested credit; and

advising the subscriber of the approval of the request for credit.

30. The method of claim 29 step of receiving includes receiving a keyword, SMS or USSD command in advance of receiving the request for credit.

31. The method of claim 29 or 30 wherein the step of converting to an intermediate value includes converting the request for credit to an equivalent US dollar amount.

32. The method of any one of claims 29 to 31 wherein the step of obtaining credit includes debiting the credit providers account on the settlement facility in the amount of the request for credit and billing the subscriber's home network account.

33. The method of claim 32 wherein the step of billing the subscriber's home network account includes converting the intermediate value to the local currency of the subscriber's home network.

34. The method of any one of claims 29 to 33 further including the step of exchanging the credit contained in a subscribers account for goods and service provided by third parties registered with the credit facility.

35. The method of any one of claims 29 to 34 wherein the step of advising includes sending an electronic notification to the subscriber.

36. A method of providing airtime to a subscriber of a mobile communications network a central settlement facility coupled to plurality of mobile communications networks said method including the steps of:

receiving at a settlement facility from at least one subscriber on a first network a request for airtime from a second network within the plurality of mobile communications coupled to the credit facility;

determining if the subscriber has an account with the credit facility;

converting the request for credit to an intermediate value on determining that the subscriber maintains an account with the credit facility;

obtaining airtime from the second network based on the intermediate value;

crediting the subscriber's account with the settlement facility in the amount of requested credit; and

advising the subscriber of the approval of the request for credit.

37. The method of claim 36 wherein the step of receiving includes firstly receiving a keyword, SMS or USSD command in advance of receiving the request for airtime.

38. The method of claim 36 or 37 wherein the first network is the network currently hosting the subscriber and the second network is the subscriber's home network.

39. The method of claim 38 wherein the request for airtime is in the local currency of the first network and the step of converting to an intermediate value includes converting the request for airtime from the first network currency to an equivalent US dollar amount.

40. The method of any one of claims 36 to 39 wherein the subscriber is a post-paid customer of the second network.

41. The method of claim 40 wherein further including the step of debiting the subscribers post-paid account on the second network in the local currency of the second network for the requested airtime.

42. The method of any one of claims 36 to 39 wherein the subscriber is a pre-paid customer of the second network.

43. The method of claim 42 wherein the step of requesting airtime includes providing a cash payment to a third party within the first network in a first currency said third party having a subscriber account with the credit facility.

44. The method of claim 43 further including the steps of debiting the third party's subscriber account in the amount of the cash payment, and crediting the subscriber's

pre-paid account in the amount of the cash payment in the local currency of the network on which the pre-paid account is maintained.

45. The method of any one of claims 36 to 44 wherein the step of advising includes sending an electronic notification to the subscriber.