A System And Method For Providing Mobile Services

FIELD OF INVENTION

This invention relates to a system and method for providing mobile services.

BACKGROUND OF INVENTION

Virtual interactive characters or avatars are widely used in computer games. Such avatar concepts are seldom found in other applications. Most development work in relation to avatars has been concerned with the graphical appearance of the virtual characters and providing interactive entertainment to the users.

On the other hand, presently, mobile services in government and private sectors are mostly provided separately. There are few or no common platform for providing all of such mobile services together and no common and easy user access to all the mobile services. Also, existing mobile service platforms are entirely user-driven. In other words, the user proactively requests the mobile service rather than the user chancing upon an available mobile service and choosing to utilize the mobile service.

A need therefore exists to provide a system and method for providing mobile services that address at least one of the above-mentioned problems.

SUMMARY OF INVENTION

In accordance with an aspect of the present invention, there is provide a system for providing mobile services, the system comprising: a mobile device executing a client application for generating a mobile service request; and a hub server for receiving and processing the mobile service request, wherein the mobile service request comprises location data of the mobile device, and the hub server pushes one or more mobile service offers to the mobile device based on the location data.

The client application may comprise an avatar-based user interface.

The client application may obtain the location data of the mobile device and provides the location data to the hub server.

The mobile service may comprise one or more of a group consisting of:

peer to peer networking;
providing information;
providing quizzes;
providing games;
pushing of advertisements;
purchase or selling of items;
bill payment; and
redeeming electronic vouchers.

The client application may learn from user inputs and adapts to user preferences.

The hub server may interact with agency servers for providing the mobile service.

The agency servers may be operated by private sector entities and by government bodies.

The hub server may utilise Web Service Orchestration Technology for seamlessly providing two or more mobile services associated with a single mobile service request.

In accordance with another aspect of the present invention, there is provided a method for providing mobile services, the method comprising: executing a client application for generating a mobile service request on a mobile device; receiving and processing the mobile service request at a hub server; and pushing one or more mobile service offers from the hub server to the mobile device based on location data, wherein the mobile service request comprises location data of the mobile device.

The client application may comprise an avatar-based user interface.

The method may further comprise obtaining the location data of the mobile device and providing the location data to a hub server utilizing the client application.

The mobile service may comprise one or more of a group consisting of:

peer to peer networking;
providing information;
providing quizzes;
providing games;
pushing of advertisements;
purchase or selling of items;
bill payment; and
redeeming electronic vouchers.

The method may further comprise learning from user inputs and adapting to user preferences utilizing the client application.

The method may further comprising interacting with agency servers for providing the mobile service utilizing the hub server.

The agency servers may be operated by private sector entities and by government bodies.

The method may further comprise providing two or more mobile services associated with a single mobile service request seamlessly utilizing Web Service Orchestration Technology at the hub server.

In accordance yet another aspect of the present invention, there is provided a data storage device containing computer readable code means for instructing a mobile device to execute a method for providing mobile services, the method comprising: executing a client application for generating a mobile service request on the mobile device for processing at a hub server; and pushing one or more mobile service offers from the hub server to the mobile device based on location data, wherein the mobile service request comprises location data of the mobile device.

BRIEF DESCRIPTIONS OF THE DRAWINGS

These and other features, objects and advantages of the present invention will be better understood and readily apparent to one of ordinary skill in the art from the following written description, used in conjunction with the attached drawings, in which:

Figure 1 is the system architecture of an example embodiment of the present invention.

Figure 2 illustrates interaction between the elements of the example embodiment of the present invention.

Figure 3 is a user interface for selecting a service.

Figure 4 is a user interface for entering user payment details.

Figure 5 is a user interface for entering credit card information.

Figure 6 illustrates interaction between the elements of the example embodiment of the present invention.

Figure 7 shows user interfaces for personal area networking.

Figure 8 shows user interfaces for messaging in a personal area network.

Figure 9 shows a menu for selecting services provided in an area.

Figure 10 shows a menu of services available at a place of interest.

Figure 11 shows a picture and a user interface relating to a place of interest.

Figure 12 shows user interfaces for taking a quiz relating to a place of interest.

Figure 13 shows user interfaces during and after user login.

Figure 14 shows user interfaces for purchasing movie tickets.

Figure 15 shows user interfaces for payment of movie tickets.

Figure 16 shows user interfaces for purchasing last minute movie tickets.

Figure 17 shows user interfaces for payment of the last minute movie tickets.

Figure 18 shows user selection to show mVoucher (mobile voucher) from a menu.

Figure 19 shows user interfaces for mVoucher redemption.

Figure 20 illustrates an electronic message received at a movie ticket counter.

Figure 21 shows user interfaces for notifying Government authorities of overseas trip.

Figure 22 illustrates a schematic drawing of a mobile device for implementing the system and method according to the example embodiment.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

With reference to Figure 1, the example embodiment comprises a system or Web Services Hub 100 interconnected via the Internet to Government Web Services 102, Commercial Web Services 104, a Payment Gateway 108, and to Mobile Users 106 through a Java 2 Mobile Enterprise (J2ME) client after Web Services Transcoding is performed.

In the example embodiment, a mobile user 106 accesses mobile services provided by the Web Services Hub 100 through a graphical, interactive, user-friendly client application referred to herein as JeneSpace that is developed in J2ME. In order to use the mobile services, the mobile user 106 first downloads JeneSpace from the Web Services Hub 100 via General Packet Radio Service (GPRS), Third Generation (3G) Telecommunication Network means, Wireless Local Area Network (WLAN) or the like into the mobile user's mobile device.

When a mobile user 106 navigates through the mobile services on his/her mobile device, JeneSpace sends a request to the Web Services Hub 100 via GPRS, 3G, WLAN or the like to obtain the content to be displayed. The content may be informational (e.g. text articles) or may be form-based. If the content is form-based, JeneSpace prompts the mobile user 106 to fill in the form and then transmits the form data to the Web Services Hub 100 for processing.

In the example embodiment, the Web Services Hub 100 integrates with government and commercial agencies 102 and 104 via standard XML Web Services to obtain the mobile content and to submit form data. When JeneSpace requests content from an agency's server, the Web Services Hub 100 transcodes the request into an XML Web Service invocation and forwards it to the agency server. The resulting content of the XML Web Service is transcoded by Web Services Hub 100 and displayed by JeneSpace. The XML Web Services are based on the World Wide Web Consortium (W3C) standards.

When the agency server is activated to collect payment in response to a user input, the agency server returns a Payment Form to the Web Services Hub 100, which will perform the payment collection. Upon payment, the Web Services Hub 100 sends a Payment Status message to the agency servers via the XML Web Service.

With reference to Figures 2, 3, 4 and 5, below is a sample scenario that illustrates the flow of events when a mobile user selects a Bill Payment service belonging to an Agency (hereinafter "Agency A") and makes a mobile payment for a bill will be described. In this example, the Web Services Hub 100 (Figure 1) is a computer server named Portal City. It is appreciated that Portal City may comprise more than one computer server for performing the tasks stated in the flow of events below.

Referring to Figure 2, at step 202, a mobile user 224 downloads and installs JeneSpace from Portal City 226 into his/her mobile device 228. This is a one-time installation.

At step 204, the mobile user 224 activates JeneSpace and selects the Bill payment service on the user interface of JeneSpace. Figure 3 shows an example of a simplified user interface or form 300 generated by JeneSpace on the mobile device 228 (Figure 2) of the mobile user 224 (Figure 2), which displays the selection of "Agency A Bill Payment" 302 and the clicking of "OK" button 304 to confirm the selection.

Referring back to Figure 2, at step 206, JeneSpace transmits the selection 302 (Figure 3) to Portal City 226 via a GPRS/3G/WLAN Network 232 and the Internet 234. Portal City 226 transcodes the request from Mobile Platform to Web platform and invokes Agency A server 230 for Web Services to obtain the content requested. In pseudo code, the representation of Portal City 226 interactions with the Agency server 230 in this step is as follow:

Portal City → Agency: GetContentWebService(Service=BillPayment)

At step 208, the Agency server 230 returns a form to Portal City 226 to be rendered for display on the mobile device, and the form contains 2 fields, Bill Number and Amount. In pseudo code, the representation of Portal City 226 interactions with the Agency server 230 in this step is as follow:

Portal City → Agency: GetContentWebService returns (BillNumber, Amount)

At step 210, Portal City 226 instructs JeneSpace to render a form for displaying on the mobile device 228. Figure 4 shows an example of a simplified user interface or the form 400 that is generated by JeneSpace on the mobile device 228 (Figure 2) of the mobile user 224 (Figure 2). The form 400 displays a Bill Number field 402 and an Amount field 404 for the mobile user 224 (Figure 2) to fill in, and an "OK" button 406 for submitting the form and confirming the payment to be made. After the form 400 is generated, the mobile user 224 (Figure 2) fills up the Bill Number field 402 with the Bill reference number and the Amount field 404 with the amount to be paid and click the "OK" button 406 for submitting the form 400.

Referring back to Figure 2, after the mobile user 224 has completed the Bill Number field 402 (Figure 4) and the Amount field 404 (Figure 4), and submitted the form 400 (Figure 4), JeneSpace transmits the form data to Portal City 226. At step 212, Portal City 226 invokes the Agency server 230 to process the form data. In pseudo code, the representation of Portal City 226 interactions with the Agency server 230 in this step is as follow:

Portal City → Agency: GetContentWebService(FormData= BillNumber:12345678, Amount:10)

At step 214, the Agency server 230 validates the form data and returns a Payment Form to request for collection of payment. A transaction reference identifier (ID) is included in the Payment Form for the Agency server 230 to track the status of the payment transaction. In pseudo code, the representation of Portal City 226 interactions with the Agency server 230 in this step is as follow:

Portal City → Agency: GetContentWebService returns (PaymentForm= TransactionRef:54321, Amount:10)

At step 216, Portal City 226 instructs JeneSpace to render a form for displaying on the mobile device 228. Figure 5 shows an example of a simplified user interface or the form 500 that is generated by JeneSpace on the mobile device 228 (Figure 2) of the mobile user 224 (Figure 2). The form 500 displays a Credit Card Number field 502 and an expiry date field of the credit card number 504 for the mobile user 224 (Figure 2) to fill in, and an "OK" button 506 to submit the form. After the form is generated, the mobile user 224 (Figure 2) enters the Credit Card Number 502 and the expiry date of the credit card number 504 and click the "OK" button 506 for submitting the form 500.

Referring back to Figure 2, at step 218, upon submission of the form 500 (Figure 5), Portal City 226 clears the payment with a Payment Gateway 108 (Figure 1) and transmits the status and the Payment Gateway's payment reference ID to the Agency server 230. In pseudo code, the representation of Portal City 226 interactions with the Agency server 230 in this step is as follow:

Portal City → Agency: GetContentWebService(PaymentStatus= TransactionRef:54321, Status:OK, PaymentRef:9876)

At step 220, the Agency server 230 returns a payment acknowledgement page to the Portal City 226 for transcoding and then instructs JeneSpace to display the acknowledgement page. In pseudo code, the representation of Portal City 226 interactions with the Agency server 230 in this step is as follow:

Portal City → Agency: GetContentWebService returns (Content= "Thank you for your payment (trans ref# 54321)")

In the example embodiment, in order to provide mobile services, the Agency server 230 exposes a Web Service named GetContentWebService. The possible parameters of GetContentWebService are:

- **Service**: This parameter is the name of the service requested by the mobile user e.g. "Bill Payment". The Web Service is required to return the content to be displayed when the request is made. The content may be plain text or a form.

- **Form Data**: This parameter is a collection of form field names and the corresponding form field values e.g. "BillNumber:12345678, Amount:10". This is invoked in response to the mobile user 224 submitting a form. The Web Service is required to return the content to be displayed subsequently. The content may be plain text or a form.

- **Payment Status**: This parameter is a collection of fields and values that indicate the status of a mobile payment transaction e.g. "TransactionRef:54321, Status:OK, PaymentRef:9876". The Web Service is required to return the content to be displayed subsequently. The content may be plain text or a form.

The transmission of forms in the Agency server 230 is based on a subset of the W3C XForms standard.

To illustrate the use of Xforms in the example embodiment, the Bill Payment form 500 in Figure 5 can be represented by the following XForm:

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<input ref="BillNumber"><label>Bill Number:</label></input>
<input ref="Amount"><label>Amount: $</label></input>
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Portal City 226 may be extended to provide location based services for mobile users. Some examples of location sensitive services are the providing of information such as promotions and activities happening around the vicinity of the mobile device user, information about specific landmarks at places of interest in the vicinity of the mobile

device user, and sending instant messages and data sharing in a selected personal network.

Figure 6 illustrates how the example embodiment provides location based services. All the mobile devices support at least the J2ME version 1.0 virtual machine, and in particular may comprise Nokia Series 60 (Symbian) and Palm Treo 650 mobile devices. It is appreciated that the example embodiment may be adapted to provide location based services to other types of mobile devices that run on different operating systems e.g. Windows Mobile or the like.

At step 602, a mobile user 612 downloads a helper Symbian Client application named JeneHelper (one time installation only) along with the JeneSpace J2ME Client application on his/her Nokia Series 60 mobile device 614. JeneHelper is a mobile application that may be developed in C++, Java etc. and uses Symbian Application Programming Interface (API).

At step 604, when the mobile device 614 is connected to a specific GSM/UMTS network cell 616, JeneSpace queries JeneHelper for the Cell ID. JeneHelper is capable of reading the Global System for Mobile Communication (GSM) or Universal Mobile Telecommunications System (UMTS) Cell ID through the Symbian API when requested by JeneSpace.

At step 606, JeneHelper obtains the Cell ID via Symbian API and returns the Cell ID to JeneSpace. JeneSpace then transmits the Cell ID to Portal City 618 (226 in Figure 2) via the Mobile Telecommunication Network 620 and the Internet 622 to translate the Cell ID into a location name.

At step 608, Portal City 618 performs the translation by looking up a database of known Cell IDs to match the Cell ID obtained from JeneHelper. If the Cell ID is not found in the database, the Portal City Server 618 returns the location that corresponds to the nearest known Cell ID.

At step 610, the location name is transmitted to an Agency server 624 via a Web Service, so that an Agency server 624 may generate location-specific content and services. To support push of mobile services by location, the Agency server transmits

content/services to a list of users who are in a particular location. This advantageously makes it possible to provide location-sensitive mobile services like "Last Minute Ticket Sales", where a cinema operator can push discounted tickets to users within a specific location just before the movie begins.

On Palm Treo 650 mobile devices, JeneHelper will be a native PalmOS application that obtains the Cell ID via the PalmOS API. For other devices, Location Based Services are still possible through JeneSpace prompting the user to enter the name of the location.

JeneSpace communicates with JeneHelper via a TCP socket (for Symbian OS) or through a shared file (for Palm OS). JeneSpace and JeneHelper both use APIs provided by the Symbian OS, Palm OS and J2ME virtual machine in the present example.

JeneSpace may comprise an avatar-based user interface named, for example, Jene, which acts as a virtual concierge that provides electronic commercial activities such as purchasing and selling. Jene interfaces the functionality of JeneSpace and JeneHelper. Jene, is capable of learning from user inputs and adapting to the user preferences. Jene is also capable of tracking the exact location of the mobile user and provides suggestions for the electronic services available at the location. For instance, Jene may send instant messages to users to alert them of events and promotions and users can send a message to Jene to request for help and recommendations e.g. "where is the nearest Shell station?". Jene may then reply by showing a map and direct the user to the location. Jene is programmed with the necessary intelligence to understand basic sentences that users may query.

JeneSpace is location sensitive and works based on the telco cell ID. JeneSpace enables searching out personnel around the user and sending of instant messages to the personnel. JeneSpace also provides updates and enable discovery of promotions and activities happening around the user. Information of landmarks in the form of sound/video clips or text and pictures may also be made available through JeneSpace to the user based on the location of the user.

In the example embodiment, JeneSpace is implemented using C++, Java or the like and is installed in the user's mobile device such as hand phones, Personal Digital Assistants (PDA) or the like upon request. With JeneSpace, users can interact with the avatar, Jene,

and with other users in the personal area network at the vicinity of the users or other users in a network of selected personnel.

JeneSpace may be used as a ubiquitous mobile tool for Secure mobile commerce transactions and Secure eGovernment (electronic Government) transactions. Example of applications for JeneSpace are purchase of products and services (e.g. movie tickets) electronically through the mobile device, redemption of electronic vouchers, viewing of mobile content such as text, images, 3G streaming video, participation in electronic quizzes, and because JeneSpace is location sensitive, merchants can push offers to users near specific locations.

Figure 7 shows two windows 700 and 706 that are created by JeneSpace when the personal network is activated.

In one window 700, static pictures or animated objects 702 are used to represent neighbouring mobile devices. The location 704, Orchard North, of the user is automatically detected and indicated on the display. The neighbouring mobile devices are detected from the surrounding area of the user mobile device via Bluetooth, WLAN or the like. The neighbouring mobile devices displayed may be configured to show only selected peers and not all detected mobile devices.

In the other window 706, the identifiers 708 of the neighbouring mobile devices at the location 704 are displayed. The identifier "Everyone" 710 is used for instant messaging to all of the detected neighbouring mobile devices shown in the window 706.

With reference to Figure 8, when the identifier of one neighbouring mobile device belonging to a peer, in this case June , is selected, a window 800 containing information of the selected peer and interaction means with the peer will appear. In the example embodiment, the window 800 contains options such as "View Pics" 802 and "Send Message" 804 and displays the name or alias of the selected peer.

Selecting "View Pics" 802 will call out another window containing a gallery of pictures taken or uploaded by the peer. Selecting "Send Message" 804 will call out an editable window 806, which the user can type messages on to be sent to the selected peer. Window 808 shows the same window 806 containing a reply from the selected peer.

Figure 9 shows a window 900 that is created by JeneSpace when the user activates a search to look for promotions and activities happening in the vicinity of the user location. For instance, in Figure 9, the user location 902 is at Orchard North. In this window 900, the options available for the user are, show mVouchers 904 (mobile vouchers), buy movie tickets 906, take an NS (National Service) Quiz 908, commence Mobile learning 910 on a particular topic, play a 3G video clip 912, help features on the usage of JeneSpace 914 and "More.." 916 for displaying more options. The promotions and activities happening in the vicinity of the user location are discovered via Bluetooth, WLAN, GPRS, 3G or the like and the information is supplied by surrounding wirelessly connected servers in the area and/or from servers via the Internet.

Figure 10 shows a window 1000 that is created by JeneSpace when the user activates a search to look for activities associated with a landmark or place of interest and information about the landmark or place of interest at the user location. Window 1000 shows the user location 1002 at the place of interest, Merlion Park. The user interaction options available are Show puzzle 1004 for playing a puzzle game about the Merlion, play a Merlion video 1006 introducing the origins of the Merlion Park, take a Merlion Quiz 1008 and show Merlion clue 1010 for the quiz. These user interaction options change depending on the time and location of the user. Discovery is performed via Bluetooth, WLAN, GPRS, 3G or the like and the information is supplied by surrounding wirelessly connected servers in the area and/or from servers via the Internet.

Figure 11 shows the starting frame 1100 of the Merlion video clip 1006 (Figure 10) and the window 1102 containing the clues 1010 (Figure 10) for the Merlion Quiz 1008 (Figure 10).

Figure 12 illustrates a user's participation in a quiz. After the user activates the NS quiz option through JeneSpace, a window 1200 containing the question of the quiz will appear. In this case, the user needs to select the correct answer from a list of choices. In Figure 12, the correct answer is the second option 1202. Windows 1204 and 1206 show the prize won for answering the quiz correctly.

Figures 13 – 15 illustrate purchasing movie tickets through JeneSpace.

In Figure 13, window 1300 shows the user login screen containing username field 1306, password field 1308 and location field 1310, all of which requires user input. It is appreciated that JeneSpace can automatically fill in fields 1306 and 1308 by reusing previous user entries or is programmed by user settings to always use the same entries for the fields. Also, the location field 1310 may be detected by JeneSpace wirelessly and then automatically filled in by JeneSpace. Window 1302 is similar to window 706 (Figure 7) and window 1302 appears after user login is successful. Window 1304 shows a menu for selecting currently held events, which can be called out from window 1302 by clicking specific icons. Examples of such icons are 1310 and 1312. The user selection from window 1304 for purchasing movie tickets is "Buy movie tickets" 1314.

After selecting "Buy movie tickets" 1314, window 1400 in Figure 14 will appear for selecting a cinema to watch the movie. In this case, Orchard cinema 1408 is selected. After selecting Orchard cinema 1408, window 1404 appears with options for selecting the movies available to watch at Orchard cinema. In this case, "King Kong" 1410 is selected. Next, in window 1406, the desired time 1412 to watch the movie is selected.

After selecting the desired time 1412, window 1500 in Figure 15 appears for selecting the quantity of movie tickets. After selecting the quantity, in this instance, one ticket with cost at $10, a window 1516 representing an mWallet or mobile wallet for payment of the ticket via credit card appears.

The mWallet window 1516 contains a summary 1502 of the cost of the number of tickets selected and entries for entering name 1504 of the owner of a credit card, credit card number 1506, expiry date 1508 of the credit card and password 1509 of the credit card owner. It is appreciated that JeneSpace can automatically fill in fields 1504, 1506, 1508 and 1509 by reusing previous user entries or is programmed by user settings to always use the same entries for the fields. For security, encryption is performed on the alphanumeric characters of the fields for the display, hence only asterisks can be seen. After the details are completed and submitted by the user in window 1516, window 1512 appears. Window 1512 summarizes the amount paid by credit card and provides a booking reference number for collection of tickets. Selecting "Exit" 1510 in window 1512 ends the movie purchase session.

Figure 16 shows the case when last minute movie tickets are bought. Window 1600 is similar to window 1300 (Figure 13), which is the user login screen. In this case, the username 1606 is pre-filled by JeneSpace by reusing a previous login entry. After login, window 1602, which is similar to window 1302 (Figure 13), appears. After the detection by the mobile phone of the user location via GSM, 3G, or the like, the location is determined. In this case, the location is at Orchard North. Window 1604 shows the confirmation window for purchase of 2 tickets for movie King Kong at 1pm in Jene cinema at cost of $10. Window 1702 and 1704 shows the mWallet and confirmation window that is similar to windows 1516 and 1512 respectively for the payment of the last minute movie tickets by credit card. Window 1702 is for entering credit card details and window 1704 summarizes the transaction and provides a booking reference for collection of the last minute movie tickets at the cinema ticket counter.

Figures 18 – 20 illustrate mVoucher (mobile voucher) redemption through JeneSpace.

The concept of mVoucher is to allow users who have previously acquired, given or won sufficient loyalty points to redeem items, vouchers for services or the like. Figure 18 shows a window 1800 with a menu of choices present for the current user location. These choices are detected by the mobile device from the surroundings and downloaded to the mobile device. In this case, "Show mVouchers" 1802 is selected.

In Figure 19, Window 1900 shows the mVouchers available at the user location. "Jene Cinemas" 1906 is selected. Window 1902 contains the details of the mVoucher. In this case, the detected mVoucher at Orchard North location comprises the deal of purchasing Jene cinema movie tickets at half price. Selecting "Redeem mVoucher" 1908 sends the user request to redeem the mVoucher to the ticketing computers used at the cinema ticket counter. Window 1904 appears to inform the user of the voucher code after selecting "Redeem mVoucher" 1908. Selecting "Exit" 1910 exits the mVoucher redemption session.

Figure 20 shows an electronic message displayed on the ticketing computers at the cinema ticket counter. The electronic message notifies the counter staff that the user wishes to redeem the mVoucher. The ticketing computers are linked to the Internet and receive the electronic message from the servers of the telco network, which the user of the mobile device is subscribed to The electronic message contains details of the

voucher code 2000, the item redeemed 2002, the personalised greeting name of the user 2004, and the date and time of the mVoucher redemption 2006. Besides utilising ticketing computers, the counter staff may be notified of the mVoucher redemption by receiving the electronic message on their mobile devices such as pagers, mobile phones, Personal Digital Assistants (PDA) or the like through communication technologies such as GSM, 3G, WLAN or the like. Another way of notification is via a point of sale credit card terminal, which can be activated to show the electronic message to the counter staff when the user swipes his/her credit card or keys in a special activation code on the terminal such as the voucher code 2000.

Figure 21 illustrates notifying relevant Government authorities of an overseas trip.

Window 2100 shows a menu of choices where "Travel overseas" 2108 is selected. Window 2102 is a menu of services related to travelling overseas. The menu of services in window 2102 are advantageously integrated together utilising Web Service Orchestration Technology by a hub server such as Portal City (226 in Figure 2) and displayed via JeneSpace on the user mobile device. Users can use the three services shown in the menu in window 2102 seamlessly i.e.buy flight tickets, notify MINDEF and buy travel insurance without having to separately click or activate each of the three services. In this case, the user selects "Notify MINDEF" 2110 , which means to notify the relevant Government authority, MINDEF, of an overseas trip. Window 2104 appears after the selection. Window 2104 contains fields for entering the citizenship identity card number 2112, the contact telephone number of the user 2114, the day of birth of the user 2116, the month of birth of the user 2118 and the year of birth of the user 2120. After entering and submitting the entered records, window 2106 appears for the user to select the city, which he/she is visiting. After that, another window (not shown in Figure 21) appears for the user to enter the duration of the trip and dates of travel.

The method of the example embodiment can be implemented on a wireless device 2200, schematically shown in Figure 22. It may be implemented as software, such as a computer program being executed within the wireless device 2200, and instructing the wireless device 2200 to conduct the method of the example embodiment.

The wireless device 2200 comprises a processor module 2202, an input module such as a keypad 2204 and an output module such as a display 2206.

The processor module 2202 is connected to a wireless network 2208 via a suitable transceiver device 2210, to enable wireless communication and/or access to e.g. the Internet or other network systems such as Wireless Local Area Network (WLAN), Wireless Personal Area Network (WPAN) or Wide Area Network (WAN).

The processor module 2202 in the example includes a processor 2212, Random Access Memory (RAM) 2214 and Read Only Memory (ROM) 2216. The processor module 2202 also includes a number of Input/Output (I/O) interfaces, for example I/O interface 2218 to the display 2206, and I/O interface 2220 to the keypad 2204.

The components of the processor module 2202 typically communicate via an interconnected bus 2222 and in a manner known to the person skilled in the relevant art.

JeneSpace may be supplied to the user of the wireless device 2200 encoded on a data storage medium such as a flash memory module or memory card/stick or downloaded via the Internet and read utilising a corresponding memory reader-writer of a data storage device 2224. JeneSpace is read and controlled in its execution by the processor 2212. Intermediate storage of program data may be accomplished using RAM 2214.

Example embodiments of the present invention may have the following features and advantages.

Government and commercial agencies may offer mobile services through J2ME + GPRS/3G/WLAN-enabled devices (e.g. mobile phones, PDAs etc.) and enable users to make payment through these devices by employing the example embodiments of the present invention. Location-based services are also supported by the infrastructure of the example embodiments.

Many modifications and other embodiments can be made to the system and its method by those skilled in the art having the understanding of the above described disclosure together with the drawings. Therefore, it is to be understood that the device and its utility is not to be limited to the above description contained herein only, and that possible modifications are to be included in the claims of the disclosure.

CLAIMS

1. A system for providing mobile services, the system comprising:

a mobile device executing a client application for generating a mobile service request; and

a hub server for receiving and processing the mobile service request,

wherein the mobile service request comprises location data of the mobile device, and the hub server pushes one or more mobile service offers to the mobile device based on the location data.

2. The system as claimed in claim 1, wherein the client application comprises an avatar-based user interface.

3. The system as claimed in claims1 or 2, wherein the client application obtains the location data of the mobile device and provides the location data to the hub server.

4. The system as claimed in any one of claims 1 to 3, wherein the mobile service comprises one or more of a group consisting of:

peer to peer networking;
providing information;
providing quizzes;
providing games;
pushing of advertisements;
purchase or selling of items;
bill payment; and
redeeming electronic vouchers.

5. The system as claimed in any one of the preceding claims, wherein the client application learns from user inputs and adapts to user preferences.

6. The system as claimed in any one of the preceding claims, wherein the hub server interacts with agency servers for providing the mobile service.

7. The system as claimed in claim 6, wherein the agency servers are operated by private sector entities and by government bodies.

8. The system as claimed in any one of the preceding claims, wherein the hub server utilises Web Service Orchestration Technology for seamlessly providing two or more mobile services associated with a single mobile service request.

9. A method for providing mobile services, the method comprising:

executing a client application for generating a mobile service request on a mobile device;

receiving and processing the mobile service request at a hub server; and

pushing one or more mobile service offers from the hub server to the mobile device based on location data, wherein the mobile service request comprises location data of the mobile device.

10. The method as claimed in claim 9, the method further comprising:

wherein the client application comprises an avatar-based user interface.

11. The method as claimed in claims 9 or 10, the method further comprising:

obtaining the location data of the mobile device and providing the location data to a hub server utilizing the client application.

12. The method as claimed in any one of claims 9 to 11, wherein the mobile service comprises one or more of a group consisting of:

peer to peer networking;

providing information;

providing quizzes;

providing games;

pushing of advertisements;

purchase or selling of items;

bill payment; and

redeeming electronic vouchers.

13. The method as claimed in any one of claims 9 to 12, the method further comprising:

learning from user inputs and adapting to user preferences utilizing the client application.

14. The method as claimed in any one of claims 9 to 13, the method further comprising:

interacting with agency servers for providing the mobile service utilizing the hub server.

15. The method as claimed in claim 14, wherein the agency servers are operated by private sector entities and by government bodies.

16. The method as claimed in any one of claims 9 to 15, the method further comprising:

providing two or more mobile services associated with a single mobile service request seamlessly utilizing Web Service Orchestration Technology at the hub server.

17. A data storage device containing computer readable code means for instructing a mobile device to execute a method for providing mobile services, the method comprising:

executing a client application for generating a mobile service request on the mobile device for processing at a hub server; and

pushing one or more mobile service offers from the hub server to the mobile device based on location data, wherein the mobile service request comprises location data of the mobile device.