Title: SYSTEM AND METHOD FOR INTERNET COMMUNICATIONS

Abstract: This invention discloses an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, including, inter alia, a methodology operative to subsidize Internet access costs in respect of interactions between a user and a web site, the methodology including automatically communicating information relating to said interactions between a user and a web site; and utilizing said information for subsidizing wireless-Internet access costs. A system operative to subsidize Internet access costs in respect of interactions between a user and a web site is also disclosed.
SYSTEM AND METHOD FOR INTERNET COMMUNICATIONS

FIELD OF THE INVENTION

The present invention relates to methodologies, systems and methods for Internet and wireless-Internet communications generally.

BACKGROUND OF THE INVENTION

The economic importance of Internet and wireless-Internet communications is undergoing a very substantial increase.

Currently wireless-Internet communication is typically billed to the user based on airtime and/or packet count. It has been proposed to bill wireless-Internet communication based on the content communicated, however the technology for implementing such billing is not yet fully developed.

The development of wireless-Internet communications is expected to create new supply and value chains interconnecting the user and the content/application provider via wireless network operators, wireless ISPs and wireless portals. These entities can be expect to participate in the value chains by providing billing services, sharing revenues and subsidizing access. Here also, the implementation technology is not yet fully developed.

Inasmuch as wireless-Internet access rates are significantly higher than land based Internet access rates, it is appreciated that lowering the cost to the user of wireless-Internet access is essential to the development of wireless-Internet.

The following U.S. Patents are believed to represent the current state of the art:

6,078,806; 6,070,066; 6,069,941; 6,061,556; 6,058,173; 6,052,450; 6,047,179;
6,044,138; 6,023,618; 6,023,499; 6,018,726; 6,016,340; 6,005,925; 5,995,602;
5,987,480; 5,966,649; 5,956,391; 5,835,712; 5,828,737; 5,752,238; 5,724,521; WO
99/27556.
SUMMARY OF THE INVENTION

The present invention seeks to provide methodologies, systems and methods particularly suitable for commercial activities on the Internet and on the wireless-Internet.

There is thus provided in accordance with a preferred embodiment of the present invention, an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a methodology operative to subsidize Internet access costs in respect of interactions between a user and a website. The methodology includes automatically communicating information relating to the interactions between a user and a website and utilizes the information for subsidizing wireless-Internet access costs.

Further in accordance with a preferred embodiment of the present invention the information relating to the interactions is automatically communicated from the at least one intermediary.

Still further in accordance with a preferred embodiment of the present invention the website subsidizes user Internet access charges of an ISP.

Additionally in accordance with a preferred embodiment of the present invention the website subsidizes user wireless-Internet access charges of a wireless network operator.

Furthermore in accordance with a preferred embodiment of the present invention the information is utilized for subsidizing at least one of packet count charges and time charges.

Moreover in accordance with a preferred embodiment of the present invention the Internet environment is an end-to-end secure Internet environment.

Still further in accordance with a preferred embodiment of the present invention the Internet environment is a non-end-to-end secure Internet environment.

Further in accordance with a preferred embodiment of the present invention the methodology also includes a fraud prevention functionality which determines whether a user receiving a subsidy in respect of an interaction actually participated in that interaction.

Additionally in accordance with a preferred embodiment of the present invention
the fraud prevention functionality includes the following functionalities: classifying users receiving subsidies over a predetermined threshold as suspect users and determining, by using information received from web sites, whether the suspect users actually participated in interactions in respect of which they were credited with a subsidy.

Further in accordance with a preferred embodiment of the present invention the information relating to the interactions is automatically communicated from the at least one of an Internet point of presence, a wireless-Internet gateway, a firewall and a router located at either an ISP or a wireless network operator facility.

Still further in accordance with a preferred embodiment of the present invention the information relating to the interactions is employed to determine whether a given interaction is entitled to a subsidy.

Additionally in accordance with a preferred embodiment of the present invention the information relating to the interactions is also employed to determine telephone numbers of users participating in the interactions to which subsidies are to be credited.

Furthermore in accordance with a preferred embodiment of the present invention the information is communicated to a processing module which is located at either an ISP or a wireless network operator facility and only part of the information is communicated from the processing module outside of either the ISP or a wireless network operator facility.

Preferably information relating to the telephone numbers of users to which subsidies are to be credited is not communicated from the processing module outside of either the ISP or a wireless network operator facility.

There is also provided in accordance with a preferred embodiment of the present invention, an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a system operative to subsidize Internet access costs in respect of interactions between a user and a web site. The system includes a data communicator automatically communicating information relating to the interactions between a user and a web site and a subsidizing engine utilizing the information for subsidizing Internet access costs.

Further in accordance with a preferred embodiment of the present invention the
data communicator automatically communicates information from the at least one intermediary in respect of the interactions.

Still further in accordance with a preferred embodiment of the present invention the web site subsidizes user Internet access charges of an ISP.

Additionally in accordance with a preferred embodiment of the present invention the web site subsidizes user wireless-Internet access charges of a wireless network operator.

Furthermore in accordance with a preferred embodiment of the present invention the information is utilized for subsidizing at least one of packet count charges and time charges.

Moreover in accordance with a preferred embodiment of the present invention the Internet environment is an end-to-end secure Internet environment.

Further in accordance with a preferred embodiment of the present invention the Internet environment is a non-end-to-end secure Internet environment.

Still further in accordance with a preferred embodiment of the present invention the system also includes a fraud prevention functionality which determines whether a user receiving a subsidy in respect of an interaction actually participated in that interaction.

Preferably the fraud prevention functionality includes the following functionalities: classifying users receiving subsidies over a predetermined threshold as suspect users and determining, by using information received from web sites, whether the suspect users actually participated in interactions in respect of which they were credited with a subsidy.

Further in accordance with a preferred embodiment of the present invention the information relating to the interactions is automatically communicated to the data communicator from at least one of an Internet point of presence, a wireless-Internet gateway, a firewall and a router located at either an ISP or a wireless network operator facility.

Additionally in accordance with a preferred embodiment of the present invention the information relating to the interactions is employed to determine whether a given interaction is entitled to a subsidy.
Furthermore in accordance with a preferred embodiment of the present invention the information relating to the interactions is also employed to determine telephone numbers of users participating in the interactions to which subsidies are to be credited.

Further in accordance with a preferred embodiment of the present invention the information is communicated to a processing module which is located at either an ISP or a wireless network operator facility and only part of the information is communicated from the processing module outside of either the ISP or a wireless network operator facility.

Preferably the information relating to the telephone numbers of users to which subsidies are to be credited is not communicated from the processing module outside of either the ISP or a wireless network operator facility.

There is further provided in accordance with yet another preferred embodiment of the present invention, an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a methodology operative to subsidize Internet access costs in respect of interactions between at least one user and at least one web site. The methodology includes determining for which of the interactions, Internet access costs are subsidized and automatically indicating to the user via the device when Internet access costs are being subsidized.

Further in accordance with a preferred embodiment of the present invention the wireless-Internet access costs are being subsidized.

Still further in accordance with a preferred embodiment of the present invention the automatically indicating includes providing a visible icon overlaid on a web page.

Additionally in accordance with a preferred embodiment of the present invention the methodology includes determining includes at least one of: the following: determining whether Internet access costs are subsidized according to the identity of a web page, determining whether Internet access costs are subsidized according to the identity of a user, determining whether Internet access costs are subsidized according to the identity of an ISP through which the interaction takes place, determining whether Internet access costs are subsidized according to the identity of a wireless network operator through which the interaction takes place and determining whether Internet access costs are subsidized. Determining whether Internet access costs are subsidized
according to more than one of: the identity of a web page, the identity of a user, the identity of an ISP through which the interaction takes place, the identity of a wireless network operator through which the interaction takes place.

Further in accordance with a preferred embodiment of the present invention the Internet environment is an end-to-end secure Internet environment.

Still further in accordance with a preferred embodiment of the present invention the Internet environment is a non-end-to-end secure Internet environment.

Additionally in accordance with a preferred embodiment of the present invention the methodology includes automatically indicating the identity of the portal which referred said user to said web site.

There is further provided according to yet another preferred embodiment of the present invention, an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a system operative to subsidize Internet access costs in respect of interactions between at least one user and at least web site. The system includes a decision engine determining for which of the interactions, Internet access costs are subsidized and an indicator generator automatically indicating to the user when Internet access costs are being subsidized.

Further in accordance with a preferred embodiment of the present invention the wireless-Internet access costs are being subsidized.

Still further in accordance with a preferred embodiment of the present invention the indicator generator generates a visible icon overlaid on a web page.

Additionally in accordance with a preferred embodiment of the present invention the decision engine operates to provide at least one of the following functionalities: determining whether Internet access costs are subsidized according to the identity of a web page, determining whether Internet access costs are subsidized according to the identity of a user, determining whether Internet access costs are subsidized according to the identity of an ISP through which the interaction takes place, determining whether Internet access costs are subsidized according to the identity of a wireless network operator through which the interaction takes place and determining whether Internet access costs are subsidized according to more than one of: the identity of a web page, the identity of a user, the identity of an ISP through which the interaction takes place,
the identity of a wireless network operator through which the interaction takes place.

Further in accordance with a preferred embodiment of the present invention the Internet environment is an end-to-end secure Internet environment.

Moreover in accordance with a preferred embodiment of the present invention the Internet environment is a non-end-to-end secure Internet environment.

Still further in accordance with a preferred embodiment of the present invention the indicator generator indicates the identity of the portal which referred said user to said web site.

There is provided according to another preferred embodiment of the present invention, an Internet environment, wherein a first multiplicity of devices operated by a second multiplicity of users communicate via a third multiplicity of intermediaries with a forth multiplicity of sites on the Internet, a methodology for subsidizing Internet access costs in respect of interactions between at least one user and at least one web site. The methodology includes automatically communicating information relating to a fifth multiplicity of transactions between users and web sites and operating a clearance center for receiving the information and supplying the information to at least one of the group consisting of: the second multiplicity of users, a sixth multiplicity of wireless ISPs, a seventh multiplicity of wireless network operators and an eighth multiplicity of content/application providers in order to subsidize Internet access costs in respect of interactions between at least one user and at least one web site.

Further in accordance with a preferred embodiment of the present invention the Internet access costs include wireless-Internet access costs.

There is thus provided in accordance with yet another preferred embodiment of the present invention, an Internet environment, wherein a first multiplicity of devices operated by a second multiplicity of users communicate via a third multiplicity of intermediaries with a fourth multiplicity of sites on the Internet, a system operative to subsidize Internet access costs in respect of interactions between at least one user and at least one web site. The system includes an information communication subsystem, automatically communicating information relating to a fifth multiplicity of transactions between users and web sites and a clearance center, receiving the information and supplying the information to at least one of the group consisting of: the second
multiplicity of users, a sixth multiplicity of wireless ISPs, a seventh multiplicity of wireless network operators and an eighth multiplicity of content/application providers in order to subsidize Internet access costs in respect of interactions between at least one user and at least one website.

Further in accordance with a preferred embodiment of the present invention the Internet access costs include wireless-Internet access costs.

Further in accordance with a preferred embodiment of the present invention the step of subsidizing includes the step of providing a subsidy for a subsidized web page notwithstanding that the web page is displayed from a cache memory of one of said multiplicity of devices employed by a user.

Preferably, the step of providing employs an HTTP link on each said subsidized web page, which is capable of being displayed from said cache memory.

Still further in accordance with a preferred embodiment of the present invention, employing said HTTP link on each said subsidized web page which is capable of being displayed from said cache memory includes the steps of employing said link to cause a browser operated by said at least one user to request a phantom object from a phantom object generator, causing said phantom object generator, in response to said request, to download said phantom object to said browser and employing said phantom object to generate a subsidy in respect of said subsidized web page.

Further in accordance with a preferred embodiment of the present invention the fraud prevention functionality includes the following functionalities: classifying users receiving subsidies over a predetermined threshold as suspect users and determining, by using information obtained by employing a phantom object, whether the suspect users actually participated in interactions in respect of which they were credited with a subsidy.

Still further in accordance with a preferred embodiment of the present invention the step of subsidizing is carried out in at least near real time.

Further in accordance with a preferred embodiment of the present invention the step of subsidizing wireless-Internet access costs employs at least one of rated or unrated information.
Additionally in accordance with a preferred embodiment of the present invention the step of subsidizing involves payment of a subsidy by an operator of said web site. Alternatively, the step of subsidizing involves payment of a subsidy by an entity other than an operator of said web site.

Moreover in accordance with a preferred embodiment of the present invention the step of subsidizing is operative to cover access costs associated with access to an Intranet web site. Additionally or alternatively, the step of subsidizing takes place in a mobile workforce environment and is operative to cover access costs associated with access to an employer Intranet web site by employees.

Further in accordance with a preferred embodiment of the present invention the step of subsidizing is operative to neutralize packet-based and time-based wireless access costs in a content-based billing environment.

Additionally in accordance with a preferred embodiment of the present invention the step of subsidizing is operative in a fixed price wireless-Internet access environment to subsidize wireless-Internet access costs based on a proportion of subsidized session parameters to non-subsidized session parameters.

Still further in accordance with a preferred embodiment of the present invention the step of subsidizing is operative in a fixed price wireless-Internet access environment to subsidize wireless-Internet access costs such that the subsidy credited to a user cannot exceed the fixed price paid by the user.

Further in accordance with a preferred embodiment of the present invention the subsidizing engine provides a subsidy for a subsidized web page notwithstanding that the web page is displayed from a cache memory of one of said multiplicity of devices employed by a user. Preferably, the subsidizing engine employs an HTTP link on each said subsidized web page, which can be displayed from said cache memory.

Preferably, the HTTP link on each said subsidized web page which can be displayed from said cache memory is employed to cause a browser operated by said at least one user to request a phantom object from a phantom object generator, which, in response to said request, downloads said phantom object to said browser and said
phantom object is employed to generate a subsidy in respect of said subsidized web page.

Further in accordance with a preferred embodiment of the present invention the fraud prevention functionality includes the following functionalities: classifying users receiving subsidies over a predetermined threshold as suspect users and determining, by using information obtained by employing a phantom object, whether the suspect users actually participated in interactions in respect of which they were credited with a subsidy.

Additionally in accordance with a preferred embodiment of the present invention the subsidizing engine at least partially operates in at least near real time.

Alternatively, the subsidizing engine employs at least one of rated or un-rated information.

Still further in accordance with a preferred embodiment of the present invention the engine employs payment of a subsidy by an operator of said web site.

Alternatively, the subsidizing engine employs payment of a subsidy by an entity other than an operator of said web site.

Further in accordance with a preferred embodiment of the present invention the subsidizing engine is operative to cover access costs associated with access to an Intranet web site.

Additionally in accordance with a preferred embodiment of the present invention the subsidizing engine operates in a mobile workforce environment and is operative to cover access costs associated with access to an employer Intranet web site by employees.

Further in accordance with a preferred embodiment of the present invention the subsidizing engine is operative to neutralize packet-based and time-based wireless access costs in a content-based billing environment.

Moreover in accordance with a preferred embodiment of the present invention the subsidizing engine is operative in a fixed price wireless-Internet access environment.
to subsidize wireless-Internet access costs based on a proportion of subsidized session parameters to non-subsidized session parameters.

Further in accordance with a preferred embodiment of the present invention the subsidizing engine is operative in a fixed price wireless-Internet access environment to subsidize wireless-Internet access costs such that the subsidy credited to a user cannot exceed the fixed price paid by the user.

Further in accordance with a preferred embodiment of the present invention the step of subsidizing comprises selectively subsidizing wireless-Internet access costs based on at least one of user status and user activity. Preferably, the user status includes user entitlement status.

Additionally or alternatively, the user activity includes completion of a commercial transaction by a user in the course of interaction between said user and said web site.

Still further in accordance with a preferred embodiment of the present invention the step of selectively subsidizing employs pages in said web site which are only accessible to selected users. Preferably, the step of subsidizing includes subsidizing less than the all of said Internet access costs.

Additionally or alternatively, the step of subsidizing less than all of said Internet access costs includes at least one of the following: crediting a user at a crediting rate which is less than a charging rate at which said user is charged for said Internet access, capping a credit to a user for a given interaction with a website and capping total credit to a user for access to a given website over a given period of time.

Further in accordance with a preferred embodiment of the present invention the step of automatically indicating comprises employing an HTTP link on said at least one web site to display a subsidy-indicating icon to said at least one user. Preferably, the step of employing includes employing said link to cause a browser operated by said at least one user to request said subsidy-indicating icon from an icon generator and causing said icon generator, in response to said request, to download said icon to said browser.
Additionally in accordance with a preferred embodiment of the present invention the icon generator is capable of downloading multiple different subsidy-indicating icons. Preferably, the icon generator is capable of downloading a different subsidy-indicating icon for at least one of each different wireless operator/ISP, each different content/application provider and each different combination of wireless operator/ISP and content/application provider in a wireless-Internet environment.

Further in accordance with a preferred embodiment of the present invention the icon appears on at least one of a subsidized web page and a menu page.

Still further in accordance with a preferred embodiment of the present invention the subsidizing engine is operative for selectively subsidizing wireless-Internet access costs based on at least one of user status and user activity.

Preferably, the user status includes user entitlement status.

Additionally or alternatively, the user activity includes completion of a commercial transaction by a user in the course of interaction between said user and said web site.

Further in accordance with a preferred embodiment of the present invention the subsidizing engine employs pages in said web site which are only accessible to selected users.

Further in accordance with a preferred embodiment of the present invention the subsidizing engine is operative to subsidize less than the all of said Internet access costs. Preferably, the subsidizing engine includes at least one of the following: a rate based creditor, crediting a user at a crediting rate which is less than a charging rate at which said user is charged for said Internet access, a per-interaction capper, capping a credit to a user for a given interaction with a website and a per-time duration capper, capping total credit to a user for access to a given website over a given period of time.

Additionally in accordance with a preferred embodiment of the present invention the automatic indication generator employs an HTTP link on said at least one web site to display a subsidy-indicating icon to said at least one user. Preferably, the automatic indication generator employs said link to cause a browser operated by said at least one
user to request said subsidy-indicating icon from an icon generator and said icon generator, in response to said request, downloads said icon to said browser.

Preferably, the icon generator is capable of downloading multiple different subsidy-indicating icons. Additionally or alternatively, the icon generator is capable of downloading a different subsidy-indicating icon for at least one of each different wireless operator/ISP, each different content/application provider and each different combination of wireless operator/ISP and content/application provider in a wireless-Internet environment.

Preferably, the icon appears on at least one of a subsidized web page and a menu page.

The present invention seeks to provide methodologies, systems and methods particularly suitable for commercial activities on the Internet and on the wireless-Internet.

There is thus provided in accordance with a preferred embodiment of the present invention an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a methodology for providing commercial information regarding interactions between a user and a web site the methodology includes communicating from the web site at least one first session identifier, coupled with first data relative to at least one session identified by the at least one session identifier, communicating from the at least one intermediary at least one second session identifier, coupled with second data relative to the at least one session identified by the at least one second session identifier and employing the at least one first and the at least one second session identifiers to correlate the first data with the second data.

Further in accordance with a preferred embodiment of the present invention the at least one intermediary handles a number of sessions which greatly exceeds a number of sessions handled by the web site, and only data for sessions identified by correlation of the at least one first and the at least one second session identifiers is received from the at least one intermediary.

Still further in accordance with a preferred embodiment of the present invention the second session identifier is employed for verifying participation of the intermediary
in the at least one session.

Additionally in accordance with a preferred embodiment of the present invention the multiplicity of devices communicate via at least one intermediary with sites on the Internet at least partially in a wireless manner.

Furthermore in accordance with a preferred embodiment of the present invention the at least one intermediary includes at least one element of the group consisting of: an Internet point of presence, a wireless-Internet gateway and a portal server.

Moreover in accordance with a preferred embodiment of the present invention the first data at least partially relates to content communicated from the web site to the user.

Preferably the first data is automatically generated by the web site on the basis of predetermined criteria.

Further in accordance with a preferred embodiment of the present invention the first data is generated by the web site upon receiving the user’s request for an interaction with the web site.

Additionally in accordance with a preferred embodiment of the present invention the at least one of the first data, the second data, the first identifier and the second identifier is utilized for revenue sharing with the at least one intermediary.

Furthermore in accordance with a preferred embodiment of the present invention the at least one of the first data, the second data, the first identifier and the second identifier is utilized for billing by at least one intermediary for user’s transactions with a web site.

Moreover in accordance with a preferred embodiment of the present invention at least one of the first data, the second data, the first identifier and the second identifier is utilized for content-based billing.

Alternatively at least one of the first data, the second data, the first identifier and the second identifier is utilized for composite content-based billing.

Preferably at least one of the first data, the second data, the first identifier and the second identifier is utilized for subsidizing Internet access costs.

There is thus provided in accordance with another preferred embodiment of the present invention an Internet environment, wherein a multiplicity of devices
communicate via at least one intermediary with sites on the Internet, a system which provides commercial information regarding interactions between a user and a web site, the system includes a web site data communicator communicating from the web site at least one first session identifier, coupled with first data relative to at least one session identified by the at least one first session identifier, and a data correlator receiving from the at least one intermediary at least one second session identifier, coupled with at least one second data relative to the at least one session and employing the at least one first and the at least one second session identifiers to correlate the first data with the second data.

Further in accordance with a preferred embodiment of the present invention at least one intermediary handles a number of sessions which greatly exceeds a number of sessions handled by the web site and only data for sessions identified by correlation of the at least one first and the at least one second session identifiers is received from the at least one intermediary.

Still further in accordance with a preferred embodiment of the present invention the second session identifier is employed for verifying participation of the intermediary in the at least one session.

Additionally in accordance with a preferred embodiment of the present invention the multiplicity of devices communicate via at least one intermediary with sites on the Internet at least partially in a wireless manner.

Preferably at least one intermediary includes at least one element of the group consisting of: an Internet point of presence, a wireless-Internet gateway and a portal server.

Further in accordance with a preferred embodiment of the present invention the first data at least partially relates to content communicated from the web site to the user.

Moreover in accordance with a preferred embodiment of the present invention the first data is automatically generated by the web site on the basis of predetermined criteria.

Additionally in accordance with a preferred embodiment of the present invention the first data is generated by the web site upon receiving the user’s request for an
interaction with the web site.

Furthermore in accordance with a preferred embodiment of the present invention at least one of the first data, the second data, the first identifier and the second identifier is utilized for revenue sharing with the at least one intermediary.

Alternatively at least one of the first data, the second data, the first identifier and the second identifier is utilized for billing by at least one intermediary for user’s transactions with a web site.

Further in accordance with a preferred embodiment of the present invention the first data, the second data, the first identifier and the second identifier is utilized for content-based billing.

Still further in accordance with a preferred embodiment of the present invention at least one of the first data, the second data, the first identifier and the second identifier is utilized for composite content-based billing.

Additionally in accordance with a preferred embodiment of the present invention at least one of the first data, the second data, the first identifier and the second identifier is utilized for subsidizing Internet access costs.

Further in accordance with a preferred embodiment of the present invention the data correlator includes at least one intermediary data module which receives from the at least one intermediary the at least one second session identifier, coupled with the second data and also receives the at least one first session identifier coupled with the first data and correlates the at least one first session identifier and the at least one second session identifier, and at least one service center which employs the correlated at least one first and at least one second session identifiers to correlate the first data with the second data.

Additionally in accordance with a preferred embodiment of the present invention at least one intermediary handles a number of sessions which greatly exceeds a number of sessions handled by the web site and also only handles data for sessions identified by correlation of the at least one first and the at least one second session identifiers is received by the at least one service center from the at least one intermediary data module.

There is thus provided in accordance with a preferred embodiment of the present
invention an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a methodology for providing commercial information regarding interactions between a user and a web site, the methodology includes communicating information requested by the user from the web site to the user, and separately from communicating information requested by the user from the web site to a recipient other than the user at least one session identifier, coupled with data relative to a session identified by the at least one session identifier.

Further in accordance with a preferred embodiment of the present invention the multiplicity of devices communicate via at least one intermediary with sites on the Internet at least partially in a wireless manner.

Still further in accordance with a preferred embodiment of the present invention the data at least partially relates to content communicated from the web site to the user and is automatically generated by the web site on the basis of predetermined criteria.

Additionally in accordance with a preferred embodiment of the present invention the data is generated by the web site upon receiving the user’s request for an interaction with the web site.

Furthermore in accordance with a preferred embodiment of the present invention at least one of the data, and the identifier is utilized for revenue sharing with the at least one intermediary.

Preferably at least one of the data, and the identifier is utilized for billing by at least one intermediary for user’s transactions with a web site.

Moreover in accordance with a preferred embodiment of the present invention at least one of the data, and the identifier is utilized for content-based billing.

Further in accordance with a preferred embodiment of the present invention at least one of the data, and the identifier is utilized for composite content-based billing.

Preferably at least one of the data, and the identifier is utilized for subsidizing Internet access costs.

There is thus provided in accordance with yet another preferred embodiment of the present invention an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a system which
provides commercial information regarding interactions between a user and a web site, the system includes a web site-user data communicator communicating information requested by the user from the web site to the user, and a web site-non user data communicator, communicating from the web site to a recipient other than the user at least one session identifier, coupled with data relative to a session identified by the at least one session identifier.

Further in accordance with a preferred embodiment of the present invention the multiplicity of devices communicate via at least one intermediary with sites on the Internet at least partially in a wireless manner.

Still further in accordance with a preferred embodiment of the present invention the data relative to a session at least partially relates to content communicated from the web site to the user.

Additionally in accordance with a preferred embodiment of the present invention the data relative to a session is automatically generated by the web site on the basis of predetermined criteria.

Furthermore in accordance with a preferred embodiment of the present invention the data relative to a session is generated by the web site upon receiving the user's request for an interaction with the web site.

Moreover in accordance with a preferred embodiment of the present invention at least one of the data relative to a session, and the identifier is utilized for revenue sharing with the at least one intermediary.

Preferably at least one of the data relative to a session, and the identifier is utilized for billing by at least one intermediary for user's transactions with a web site.

Further in accordance with a preferred embodiment of the present invention at least one of the data relative to a session, and the identifier is utilized for content-based billing.

Additionally in accordance with a preferred embodiment of the present invention at least one of the data relative to a session, and the identifier is utilized for composite content-based billing.

Alternatively at least one of the data relative to a session, and the identifier is utilized for subsidizing Internet access costs.
There is further provided in accordance with a preferred embodiment of the present invention an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a methodology for providing commercial information regarding interactions between a user and a web site, the methodology includes communicating from the at least one intermediary, at least one session identifier, and employing the session identifier for verifying participation of the intermediary in a session between the user and the web site.

There is further provided in accordance with yet another preferred embodiment of the present invention an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a system for providing commercial information regarding interactions between a user and a web site, the system includes an intermediary data communicator communicating from at least one intermediary at least one session identifier and employing the session identifier for verifying participation of the intermediary in a session between the user and the web site.

There is also provided in accordance with a preferred embodiment of the present invention an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a methodology operative to provide commercial information regarding interactions between a user and a web site, the methodology includes communicating information requested by the user from the web site to the user, and separately from communicating information requested by the user from the web site to the user, automatically generating at the web site data at least partially relating to the information communicated from the web site to the user.

Further in accordance with a preferred embodiment of the present invention the multiplicity of devices communicate via at least one intermediary with sites on the Internet at least partially in a wireless manner.

Still further in accordance with a preferred embodiment of the present invention at least one intermediary includes at least one element of the group consisting of: an Internet point of presence, a wireless-Internet gateway and a portal server.

Additionally in accordance with a preferred embodiment of the present invention the data at least partially relates to content communicated from the web site to the user.
Furthermore in accordance with a preferred embodiment of the present invention the data is automatically generated by the web site on the basis of predetermined criteria.

Alternatively in accordance with a preferred embodiment of the present invention the data is generated by the web site upon receiving the user’s request for an interaction with the web site.

Further in accordance with a preferred embodiment of the present invention the data is utilized for revenue sharing with the at least one intermediary.

Preferably the data is utilized for billing by at least one intermediary for user’s transactions with a web site.

Further in accordance with a preferred embodiment of the present invention the data is utilized for content-based billing.

Additionally the data is utilized for composite content-based billing.

Further in accordance with a preferred embodiment of the present invention the data is utilized for subsidizing Internet access costs.

There is also provided in accordance with a preferred embodiment of the present invention an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a system for providing commercial information regarding interactions between a user and a web site, the system includes a web site-user data communicator communicating information requested by the user from the web site to the user, and a web site data generator automatically generating data at least partially relating to the information communicated from the web site to the user.

Further in accordance with a preferred embodiment of the present invention the multiplicity of devices communicate via at least one intermediary with sites on the Internet at least partially in a wireless manner.

Still further in accordance with a preferred embodiment of the present invention at least one intermediary includes at least one element of the group consisting of: an Internet point of presence, a wireless-Internet gateway and a portal server.

Additionally in accordance with a preferred embodiment of the present invention the data at least partially relates to content communicated from the web site to the user.
Furthermore in accordance with a preferred embodiment of the present invention the data is automatically generated by the web site on the basis of predetermined criteria.

Furthermore in accordance with a preferred embodiment of the present invention the data is generated by the web site upon receiving the user's request for an interaction with the web site.

Moreover in accordance with a preferred embodiment of the present invention at least one of the data is utilized for revenue sharing with the at least one intermediary.

Additionally in accordance with a preferred embodiment of the present invention at least one of the data is utilized for billing by at least one intermediary for user's transactions with a web site.

Further in accordance with a preferred embodiment of the present invention the data is utilized for content-based billing.

Alternatively at least one of the data is utilized for composite content-based billing.

Further in accordance with a preferred embodiment of the present invention at least one of the data is utilized for subsidizing Internet access costs.

There is also provided in accordance with a preferred embodiment of the present invention, an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a system for providing commercial information regarding interactions between a user and a web site, the system includes a content server data module communicating from the web site at least one first session identifier, coupled with first data relative to at least one session identified by the at least one first session identifier, and an intermediary data module communicating from the at least one intermediary at least one second session identifier, coupled with second data relative to the at least one session and employing the at least one first and the at least one second session identifiers to enable correlation of the first data with the second data.

Further in accordance with a preferred embodiment of the present invention at least one intermediary handles a number of sessions which greatly exceeds a number of sessions handled by the web site, and only data for sessions identified by correlation of the at least one first and the at least one second session identifiers is received from the at
least one intermediary.

Still further in accordance with a preferred embodiment of the present invention the second session identifier is employed for verifying participation of the intermediary in the at least one session.

Additionally in accordance with a preferred embodiment of the present invention the multiplicity of devices communicate via at least one intermediary with sites on the Internet at least partially in a wireless manner.

Furthermore in accordance with a preferred embodiment of the present invention at least one intermediary includes at least one element of the group consisting of: an Internet point of presence, a wireless-Internet gateway and a portal server.

Moreover in accordance with a preferred embodiment of the present invention the first data at least partially relates to content communicated from the web site to the user.

Further in accordance with a preferred embodiment of the present invention the first data is automatically generated by the web site on the basis of predetermined criteria.

Alternatively the first data is generated by the web site upon receiving the user’s request for an interaction with the web site.

Further in accordance with a preferred embodiment of the present invention at least one of the first data, the second data, the first identifier and the second identifier is utilized for revenue sharing with the at least one intermediary.

Still further in accordance with a preferred embodiment of the present invention at least one of the first data, the second data, the first identifier and the second identifier is utilized for billing by at least one intermediary for user’s transactions with a web site.

Further in accordance with a preferred embodiment of the present invention at least one of the first data, the second data, the first identifier and the second identifier is utilized for content-based billing.

Furthermore in accordance with a preferred embodiment of the present invention at least one of the first data, the second data, the first identifier and the second identifier is utilized for composite content-based billing.

Alternatively at least one of the first data, the second data, the first identifier and
the second identifier is utilized for subsidizing Internet access costs.

There is also provided in accordance with yet another preferred embodiment of the present invention an Internet environment, wherein a multiplicity of devices communicate via an Internet point of presence with sites on the Internet, a methodology for providing commercial information regarding interactions between a user and a web site, the methodology includes communicating from the web site at least one first session identifier, coupled with first data relative to at least one session identified by the at least one first session identifier, communicating from the Internet point of presence at least one second session identifier, coupled with second data relative to the at least one session identified by the at least one second session identifier, and employing the at least one first and the at least one second session identifiers to correlate the first data with the second data.

Further in accordance with a preferred embodiment of the present invention the Internet point of presence handles a number of sessions which greatly exceeds a number of sessions handled by the web site, and only data for sessions identified by correlation of the at least one first and the at least one second session identifiers is received from the Internet point of presence.

Still further in accordance with a preferred embodiment of the present invention the second session identifier is employed for verifying participation of the Internet point of presence in the at least one session.

Furthermore in accordance with a preferred embodiment of the present invention the multiplicity of devices communicate via the Internet point of presence with sites on the Internet at least partially in a wireless manner.

There is also provided in accordance with yet another preferred embodiment of the present invention an Internet environment, wherein a multiplicity of devices communicate via an Internet point of presence with sites on the Internet, a system for providing commercial information regarding interactions between a user and a web site, the system includes a web site data communicator communicating from the web site at least one first session identifier, coupled with first data relative to at least one session identified by the at least one session identifier, and a data correlator receiving from the Internet point of presence at least one second session identifier, coupled with at least
one second data relative to the at least one session and employing the at least one first and the at least one second session identifiers to correlate the first data with the second data.

Further in accordance with a preferred embodiment of the present invention the data correlator includes at least one Internet point of presence data module which receives from the Internet point of presence the at least one second session identifier, coupled with the second data and also receives the at least one first session identifier coupled with the first data and correlates the at least one first session identifier and the at least one second session identifier, and at least one service center which employs the correlated at least one first and at least one second session identifiers to correlate the first data with the second data.

Still further in accordance with a preferred embodiment of the present invention the Internet point of presence handles a number of sessions which greatly exceeds a number of sessions handled by the web site, only data for sessions identified by correlation of the at least one first and the at least one second session identifiers is received by the at least one service center from the Internet point of presence data module.

There is also provided in accordance with yet another preferred embodiment of the present invention an Internet environment, wherein a multiplicity of devices communicate via an Internet point of presence with sites on the Internet, a methodology for providing commercial information regarding interactions between a user and a web site, the methodology includes communicating information requested by the user from the web site to the user, and separately from communicating information requested by the user from the web site to a recipient other than the user at least one session identifier, coupled with data relative to a session identified by the at least one session identifier.

There is further provided in accordance with yet another preferred embodiment of the present invention an Internet environment, wherein a multiplicity of devices communicate via an Internet point of presence with sites on the Internet, a system for providing commercial information regarding interactions between a user and a web site, the system includes a web site-user data communicator communicating information
requested by the user from the web site to the user, and a web site- non user data communicator, communicating from the web site to a recipient other than the user at least one session identifier, coupled with data relative to a session identified by the at least one session identifier.

There is provided in accordance with yet another preferred embodiment of the present invention an Internet environment, wherein a multiplicity of devices communicate via an Internet point of presence with sites on the Internet, a system for providing commercial information regarding interactions between a user and a web site, the system includes a content server data module communicating from the web site at least one first session identifier, coupled with first data relative to at least one session identified by the at least one first session identifier, and an Internet point of presence data module communicating from the Internet point of presence at least one second session identifier, coupled with second data relative to the at least one session and employing the at least one first and the at least one second session identifiers to enable correlation of the first data with the second data.

There is further provided in accordance with a preferred embodiment of the present invention an Internet environment, wherein a multiplicity of devices communicate via a wireless-Internet gateway with sites on the Internet, a methodology for providing commercial information regarding interactions between a user and a web site, the methodology includes communicating from the web site at least one first session identifier, coupled with first data relative to at least one session identified by the at least one first session identifier, communicating from the wireless-Internet gateway at least one second session identifier, coupled with second data relative to the at least one session identified by the at least one second session identifier, and employing the at least one first and the at least one second session identifiers to correlate the first data with the second data.

Further in accordance with a preferred embodiment of the present invention the wireless-Internet gateway handles a number of sessions which greatly exceeds a number of sessions handled by the web site, and only data for sessions identified by correlation of the at least one first and the at least one second session identifiers is received from the wireless-Internet gateway.
Still further in accordance with a preferred embodiment of the present invention the second session identifier is employed for verifying participation of the wireless-Internet gateway in the at least one session.

Additionally in accordance with a preferred embodiment of the present invention the multiplicity of devices communicate via the wireless-Internet gateway with sites on the Internet at least partially in a wireless manner.

There is further provided in accordance with a preferred embodiment of the present invention an Internet environment, wherein a multiplicity of devices communicate via a wireless-Internet gateway with sites on the Internet, a system for providing commercial information regarding interactions between a user and a web site, the system includes a web site data communicator communicating from the web site at least one first session identifier, coupled with first data relative to at least one session identified by the at least one session identifier, and a data correlator receiving from the wireless-Internet gateway at least one second session identifier, coupled with at least one second data relative to the at least one session and employing the at least one first and the at least one second session identifiers to correlate the first data with the second data.

Further in accordance with a preferred embodiment of the present invention the data correlator includes at least one wireless-Internet gateway data module which receives from the wireless-Internet gateway the at least one second session identifier, coupled with the second data and also receives the at least one first session identifier coupled with the first data and correlates the at least one first session identifier and the at least one second session identifier, and at least one service center which employs the correlated at least one first and at least one second session identifiers to correlate the first data with the second data.

Still further in accordance with a preferred embodiment of the present invention the wireless-Internet gateway handles a number of sessions which greatly exceeds a number of sessions handled by the web site, and only data for sessions identified by correlation of the at least one first and the at least one second session identifiers is received by the at least one service center from the wireless-Internet gateway data module.
There is further provided in accordance with a preferred embodiment of the present invention an Internet environment, wherein a multiplicity of devices communicate via a wireless-Internet gateway with sites on the Internet, a methodology for providing commercial information regarding interactions between a user and a web site, the methodology includes communicating information requested by the user from the web site to the user, and separately from communicating information requested by the user from the web site to a recipient other than the user at least one session identifier, coupled with data relative to a session identified by the at least one session identifier.

There is further provided in accordance with a preferred embodiment of the present invention an Internet environment, wherein a multiplicity of devices communicate via a wireless-Internet gateway with sites on the Internet, a system for providing commercial information regarding interactions between a user and a web site, the system includes a web site- user data communicator communicating information requested by the user from the web site to the user, and a web site- non user data communicator, communicating from the web site to a recipient other than the user at least one session identifier, coupled with data relative to a session identified by the at least one session identifier.

There is further provided in accordance with a preferred embodiment of the present invention an Internet environment, wherein a multiplicity of devices communicate via a wireless-Internet gateway with sites on the Internet, a system for providing commercial information regarding interactions between a user and a web site, the system includes a content server data module communicating from the web site at least one first session identifier, coupled with first data relative to at least one session identified by the at least one first session identifier, and a wireless-Internet gateway data module communicating from the wireless-Internet gateway at least one second session identifier, coupled with second data relative to the at least one session and employing the at least one first and the at least one second session identifiers to enable correlation of the first data with the second data.

There is further provided in accordance with a preferred embodiment of the present invention an Internet environment, wherein a multiplicity of devices
communicate with sites on the Internet, a methodology for providing commercial information regarding interactions between a user and a web site, the interactions being initiated by a link from a portal server, the methodology includes communicating from the web site at least one first session identifier, coupled with first data relative to at least one session identified by the at least one first session identifier, communicating from the portal server at least one second session identifier, coupled with second data relative to the at least one session identified by the at least one second session identifier, and employing the at least one first and the at least one second session identifiers to correlate the first data with the second data.

Further in accordance with a preferred embodiment of the present invention the portal server handles a number of sessions which greatly exceeds a number of sessions handled by the web site, and only data for sessions identified by correlation of the at least one first and the at least one second session identifiers is received from the portal server.

Still further in accordance with a preferred embodiment of the present invention the second session identifier is employed for verifying participation of the portal server in the at least one session.

Further in accordance with a preferred embodiment of the present invention the multiplicity of devices communicate with sites on the Internet at least partially in a wireless manner.

There is further provided in accordance with a preferred embodiment of the present invention an Internet environment, wherein a multiplicity of devices communicate with sites on the Internet, a system for providing commercial information regarding interactions between a user and a web site, the interactions being initiated by a link from a portal server, the system includes a web site data communicator communicating from the web site at least one first session identifier, coupled with first data relative to at least one session identified by the at least one session identifier, and a data correlator receiving from the portal server at least one second session identifier, coupled with at least one second data relative to the at least one session and employing the at least one first and the at least one second session identifiers to correlate the first data with the second data.
Further in accordance with a preferred embodiment of the present invention the data correlator includes at least one portal server data module which receives from the portal server the at least one second session identifier, coupled with the second data and also receives the at least one first session identifier coupled with the first data and correlates the at least one first session identifier and the at least one second session identifier, and at least one service center which employs the correlated at least one first and at least one second session identifiers to correlate the first data with the second data.

Still further in accordance with a preferred embodiment of the present invention the portal server handles a number of sessions which greatly exceeds a number of sessions handled by the web site, only data for sessions identified by correlation of the at least one first and the at least one second session identifiers is received by the at least one service center from the portal server data module.

There is further provided in accordance with a preferred embodiment of the present invention an Internet environment, wherein a multiplicity of devices communicate with sites on the Internet, a methodology for providing commercial information regarding interactions between a user and a web site, the interactions being initiated by a link from a portal server, the methodology includes communicating information requested by the user from the web site to the user, and separately from communicating information requested by the user from the web site to the user, communicating from the web site to a recipient other than the user at least one session identifier, coupled with data relative to a session identified by the at least one session identifier.

There is further provided in accordance with a preferred embodiment of the present invention an Internet environment, wherein a multiplicity of devices communicate with sites on the Internet, a system for providing commercial information regarding interactions between a user and a web site, the interactions being initiated by a link from a portal server, the system includes a web site-user data communicator communicating information requested by the user from the web site to the user, and a web site-non user data communicator, communicating from the web site to a recipient other than the user at least one session identifier, coupled with data relative to a session identified by the at least one session identifier.
There is further provided in accordance with a preferred embodiment of the present invention an Internet environment, wherein a multiplicity of devices communicate with sites on the Internet, a system for providing commercial information regarding interactions between a user and a web site, the interactions being initiated by a link from a portal server, the system includes a content server data module communicating from the web site at least one first session identifier, coupled with first data relative to at least one session identified by the at least one first session identifier, and a portal server data module communicating from the portal server at least one second session identifier, coupled with second data relative to the at least one session and employing the at least one first and the at least one second session identifiers to enable correlation of the first data with the second data.

There is further provided in accordance with a preferred embodiment of the present invention an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a methodology operative to provide revenue sharing with the at least one intermediary in respect of interactions between a user and a web site, the methodology includes automatically communicating from the web site to at least one recipient other than the user information relating to the interactions between a user and a web site, and utilizing the information for revenue sharing.

Further in accordance with a preferred embodiment of the present invention the methodology also includes automatically communicating additional information from the at least one intermediary in respect of the interactions, and utilizing the additional information for revenue sharing.

There is further provided in accordance with a preferred embodiment of the present invention an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a system for providing revenue sharing with the at least one intermediary in respect of interactions between a user and a web site, the system includes a web site data communicator automatically communicating from the web site to at least one recipient other than the user information relating to the interactions between a user and a web site, and a revenue sharing engine utilizing the information for revenue sharing.
Further in accordance with a preferred embodiment of the present invention the system also includes an intermediary communicator automatically communicating additional information from the at least one intermediary in respect of the interactions, and wherein the revenue sharing engine also utilizes the additional information for revenue sharing.

There is further provided in accordance with a preferred embodiment of the present invention an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a methodology for providing billing by an intermediary for transactions with a web site, the methodology includes automatically communicating from the web site to at least one recipient other than the user information relating to the transactions between a user and a web site, and utilizing the information for billing by an intermediary for transactions with a web site.

Further in accordance with a preferred embodiment of the present invention the methodology also includes automatically communicating additional information from the at least one intermediary in respect of the transactions, and utilizing the additional information for billing by an intermediary for transactions with a web site.

There is further provided in accordance with a preferred embodiment of the present invention an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a system for providing billing by an intermediary for transactions with a web site, the system includes a web site data communicator automatically communicating from the web site to at least one recipient other than the user information relating to the transactions between a user and a web site, and a billing by an intermediary engine utilizing the information for billing by an intermediary for transactions with a web site.

Further in accordance with a preferred embodiment of the present invention the system also includes an intermediary communicator automatically communicating additional information from the at least one intermediary in respect of the transactions, and wherein the billing by an intermediary engine also utilizes the additional information for billing by an intermediary for transactions with a web site.

There is further provided in accordance with a preferred embodiment of the present invention an Internet environment, wherein a multiplicity of devices
communicate via at least one intermediary with sites on the Internet, a methodology for providing revenue sharing with the at least one intermediary in respect of interactions between a user and a web site, the methodology includes automatically communicating from the web site to at least one recipient other than the user information relating to the interactions between a user and a web site, and utilizing the information for revenue sharing with a wireless network operator.

Further in accordance with a preferred embodiment of the present invention the methodology also includes automatically communicating additional information from the at least one intermediary in respect of the interactions, and utilizing the additional information for revenue sharing with the wireless network operator.

There is also provided in accordance with yet another preferred embodiment of the present invention an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a system for providing revenue sharing with the at least one intermediary in respect of interactions between a user and a web site, the system includes a web site data communicator automatically communicating from the web site to at least one recipient other than the user information relating to the interactions between a user and a web site, and a revenue sharing engine utilizing the information for revenue sharing with a wireless network operator.

Further in accordance with a preferred embodiment of the present invention the system also includes an intermediary communicator automatically communicating additional information from the at least one intermediary in respect of the interactions, and wherein the revenue sharing engine also utilizes the additional information for revenue sharing with the wireless network operator.

There is also provided in accordance with yet another preferred embodiment of the present invention an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a methodology for providing billing by an intermediary for transactions with a web site, the methodology includes automatically communicating from the web site to at least one recipient other than the user information relating to the transactions between a user and a web site, and utilizing the information for billing by a wireless network operator for transactions with
a web site.

Further in accordance with a preferred embodiment of the present invention the methodology also includes automatically communicating additional information from the at least one intermediary in respect of the transactions, and utilizing the additional information for billing by the wireless network operator for transactions with a web site.

There is further provided in accordance with yet another preferred embodiment of the present invention an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a system for providing billing by an intermediary for transactions with a web site, the system includes a web site data communicator automatically communicating from the web site to at least one recipient other than the user information relating to the transactions between a user and a web site, and a billing by an intermediary engine utilizing the information for billing by a wireless network operator for transactions with a web site.

Further in accordance with a preferred embodiment of the present invention the system also includes an intermediary communicator automatically communicating additional information from the at least one intermediary in respect of the transactions, and wherein the billing by an intermediary engine also utilizes the additional information for billing by the wireless network operator for transactions with a web site.

There is further provided in accordance with yet another preferred embodiment of the present invention an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a methodology for providing content-based billing in respect of interactions between a user and a web site the methodology includes automatically communicating from the web site to at least one recipient other than the user information relating to the interactions between a user and a web site, and utilizing the information for content-based billing.

Further in accordance with a preferred embodiment of the present invention the methodology also includes automatically communicating additional information from the at least one intermediary in respect of the interactions, and utilizing the additional information for content-based billing.

There is also provided in accordance with yet another preferred embodiment of the present invention an Internet environment, wherein a multiplicity of devices
communicate via at least one intermediary with sites on the Internet, a system for providing content-based billing in respect of interactions between a user and a web site, the system includes a web site data communicator automatically communicating from the web site to at least one recipient other than the user information relating to the interactions between a user and a web site, and a content-based billing engine utilizing the information for content-based billing.

Further in accordance with a preferred embodiment of the present invention the system also includes an intermediary communicator automatically communicating additional information from the at least one intermediary in respect of the interactions, and wherein the content-based billing engine also utilizes the additional information for content-based billing.

There is also provided in accordance with yet another preferred embodiment of the present invention an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a methodology for providing composite content-based billing in respect of interactions between a user and a web site, the methodology includes automatically communicating from the web site to at least one recipient other than the user information relating to the interactions between a user and a web site, and utilizing the information for composite content-based billing.

Further in accordance with a preferred embodiment of the present invention the methodology also includes automatically communicating additional information from the at least one intermediary in respect of the interactions, and utilizing the additional information for composite content-based billing.

There is also provided in accordance with yet another preferred embodiment of the present invention an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a system for providing composite content-based billing in respect of interactions between a user and a web site, the system includes a web site data communicator automatically communicating from the web site to at least one recipient other than the user information relating to the interactions between a user and a web site, and a composite content-based billing engine utilizing the information for composite content-based billing.
Further in accordance with a preferred embodiment of the present invention the system also includes an intermediary communicator automatically communicating additional information from the at least one intermediary in respect of the interactions, and wherein the composite content-based billing engine also utilizes the additional information for composite content-based billing.

There is also provided in accordance with yet another preferred embodiment of the present invention an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a methodology for subsidizing Internet access costs in respect of interactions between a user and a web site, the methodology includes automatically communicating from the web site to at least one recipient other than the user information relating to the interactions between a user and a web site, and utilizing the information for wireless-Internet access costs.

Further in accordance with a preferred embodiment of the present invention the methodology also includes automatically communicating additional information from the at least one intermediary in respect of the interactions, and utilizing the additional information for subsidizing Internet access costs.

Still further in accordance with a preferred embodiment of the present invention the web site subsidizes user Internet access charges of an ISP.

Additionally in accordance with a preferred embodiment of the present invention the web site subsidizes user wireless-Internet access charges of a wireless network operator.

Furthermore in accordance with a preferred embodiment of the present invention the information is utilized for subsidizing at least one of packet count charges and time charges.

There is also provided in accordance with yet another preferred embodiment of the present invention an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a system for subsidizing Internet access costs in respect of interactions between a user and a web site, the system includes a web site data communicator automatically communicating from the web site to at least one recipient other than the user information relating to the interactions between a user and a web site, and a subsidizing engine utilizing the
information for subsidizing Internet access costs.

Further in accordance with a preferred embodiment of the present invention the system also includes an intermediary communicator automatically communicating additional information from the at least one intermediary in respect of the interactions, and wherein the subsidizing engine also utilizes the additional information for subsidizing Internet access costs.

Still further in accordance with a preferred embodiment of the present invention the web site subsidizes user wireless-Internet access charges of a wireless network operator.

Additionally in accordance with a preferred embodiment of the present invention the information is utilized for subsidizing at least one of packet count charges and time charges.

There is also provided in accordance with yet another preferred embodiment of the present invention an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a methodology for subsidizing Internet access costs in respect of interactions between a user and a web site, the methodology includes determining for which of the interactions, Internet access costs are subsidized, and automatically indicating to the user via the device when Internet access costs are being subsidized.

Further in accordance with a preferred embodiment of the present invention the wireless-Internet access costs are being subsidized.

There is also provided in accordance with yet another preferred embodiment of the present invention an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a system for subsidizing Internet access costs in respect of interactions between a user and a web site, the system includes a decision engine determining for which of the interactions, Internet access costs are subsidized, and an indicator generator automatically indicating to the user via the device when Internet access costs are being subsidized.

Further in accordance with a preferred embodiment of the present invention the wireless-Internet access costs are being subsidized.

There is further provided in accordance with yet another preferred embodiment
of the present invention an Internet environment, wherein a first multiplicity of devices communicate via a second multiplicity of intermediaries with third multiplicity of sites on the Internet, a methodology for providing commercial information regarding interactions between users and web sites, the methodology includes automatically communicating at least from some of the third multiplicity of sites, information relating to a fourth multiplicity of transactions between users and web sites, and supplying the information to at least one of the group consisting of: the users, the second multiplicity of intermediaries and the third multiplicity of sites.

There is also provided in accordance with yet another preferred embodiment of the present invention an Internet environment, wherein a first multiplicity of devices communicate via a second multiplicity of intermediaries with third multiplicity of sites on the Internet, a system for providing commercial information regarding interactions between users and web sites, the system includes a web site information communication subsystem, automatically communicating at least from some of the third multiplicity of sites, information relating to a fourth multiplicity of transactions between users and web sites, and a clearance center, receiving the information and supplying the information to at least one of the group consisting of: the users, the second multiplicity of intermediaries and the third multiplicity of sites.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be understood and appreciated more fully from the following detailed description, in which:

Fig. 1 is a simplified block diagram illustration of a preferred embodiment of the present invention;

Fig. 2 is a simplified block diagram illustration of a preferred embodiment of the invention in a wireless-Internet environment;

Fig. 3 is a simplified block diagram illustration of a preferred embodiment of the invention in an Internet environment;
Fig. 4 is a simplified block diagram illustration of a content server data module useful in the invention described hereinabove with reference to Figs. 1 - 3;

Fig. 5 is a simplified block diagram illustration of a gateway data module useful in the invention described hereinabove with reference to Fig. 2;

Fig. 6 is a simplified block diagram illustration of a POP data module useful in the invention described hereinabove with reference to Fig. 1 - 3;

Fig. 7 is a simplified block diagram illustration of a portal data module useful in the invention described hereinabove with reference to Fig. 1 - 3;

Fig. 8 is a simplified block diagram illustration of a service center module useful in the invention described hereinabove with reference to Figs. 1 - 3;

Fig. 9 is a simplified block diagram illustration of a preferred embodiment of the invention configured for operation in a subsidized access wireless-Internet environment;

Figs. 10A – 10F are simplified flow charts illustrating the operation of the system and methodology of the present invention as shown in Fig. 9 in a subsidized access wireless-Internet environment; and

Fig. 11 is a simplified block diagram illustrating the operation of a clearance center useful in the invention described hereinabove in a subsidized access wireless-Internet environment.

Figs. 12A & 12B are simplified block diagram illustrations of two other preferred embodiments of the invention configured for operation in a subsidized access wireless-Internet environment;

Fig. 13 is a simplified block diagram illustration of a wireless network operator/wireless ISP processing module (WOIPM) useful in the embodiment of Figs. 12A and 12B;

Fig. 14 is a simplified block diagram illustration of a service center useful in the embodiments of Figs. 12A, 12B and 13;

Fig. 15 is a simplified block diagram illustration of a content/application provider facility associated with the fraud monitor and service center in the embodiments of Figs. 12A-12B, and 14;
Fig. 16 is a simplified block diagram illustration of a content/application provider facility associated with the icon generator and service center in the embodiments of Figs. 12A-12B and 13-15;

Fig. 17 is a simplified block diagram illustration of a content/application provider facility associated with the CPGW collector, service center and WOIPMs in the embodiment of Fig. 12B;

Figs. 18A and 18B are simplified block diagram illustrations of two alternative embodiments of a content/application provider facility associated with the icon generator and service center in the embodiment of Fig. 12B;

Figs. 19A and 19B are simplified block diagram illustrations of two alternative embodiments of a content/application provider facility associated with the phantom object generator (POG) and service center in the embodiment of Fig. 12B;

Figs. 20A - 20C are simplified flow charts illustrating the operation of the WOIPM as shown in Fig. 12A in a subsidized access wireless-Internet environment;

Fig. 21 is a simplified flow chart illustrating the operation of the service center as shown in Fig. 12A in a subsidized access wireless-Internet environment;

Fig. 22 is a simplified flow chart illustrating the operation of the icon generator shown in Figs. 12A & 12B in a subsidized access wireless-Internet environment;

Fig. 23 is a simplified flow chart illustrating the operation of the fraud monitor 744 as shown in Fig. 12A in a subsidized access wireless-Internet environment;

Fig. 24 is a simplified flow chart illustrating the operation of the service center in association with fraud monitor 744 as shown in Fig. 12A in the case of suspected fraud in a subsidized access wireless-Internet environment;

Figs. 25A and 25B are simplified flow charts respectively illustrating the operation of the service center and of the WOIPM in the presence of CPGW collector, as shown in Fig. 12B in a subsidized access wireless-Internet environment;

Fig. 26 is a simplified flow chart illustrating the operation of the icon generator 824 shown in Fig. 12B in a subsidized access wireless-Internet environment;
Fig. 27 is a simplified flow chart illustrating the operation of the service center in the environment of the POG as shown in Fig. 12B in a case of suspected fraud in a subsidized access wireless-Internet environment.

Fig. 28 is a simplified illustration of the appearance on a wireless-Internet communicator of a multi-page web site useful in accordance with an embodiment of the present invention for enabling user-selective session subsidies;

Fig. 29 is a simplified flow chart illustrating the functionality of the WOIPM in providing user-selective session subsidies and employing the multi-page web site of Fig. 28;

Fig. 30 is a simplified illustration of the appearance on a wireless-Internet communicator of a multi-page web site useful in accordance with an embodiment of the present invention for enabling transaction-based session subsidies;

Fig. 31 is a simplified flow chart illustrating the functionality of the WOIPM in providing transaction-based session subsidies and employing the multi-page web site of Fig. 30; and

Figs. 32A and 32B are simplified illustrations of two alternative modes of presentation of a subsidized access icon of the present invention on the screen of a wireless-Internet communicator.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Reference is now made to Fig. 1, which is a simplified block diagram illustration of a preferred embodiment of the present invention. As seen in Fig. 1, an Internet communicator 10, such as a personal computer, a network computer, an Internet enabled wireless telephone or an Internet enabled wireless PDA, communicates via the Internet or via the wireless-Internet with a web site having an Internet content/application server 20. This communication is typically made via one or more intermediary 30. Examples of intermediaries include an ISP Internet POP (Point of Presence), a portal and a wireless-Internet gateway. The communication between the Internet communicator 10, the intermediary 30 and the server 20 as well as between multiple intermediaries, if
provided, may be entirely Internet communication or partially Internet and partially non-Internet communication. All or some of the communication between Internet communicator 10, the intermediary 30 and the server 20 as well as between multiple intermediaries may be wireless.

It is appreciated that there exist a plurality of intermediaries 30, each of which may or may not form part of the system of the present invention. Similarly, there exist a multiplicity of content/application servers 20, each of which may or may not form part of the system of the present invention. For the sake of conciseness and clarity, the description of the present invention relates to a situation where an Internet communicator 10 communicates with a content/application server 20 via an intermediary 30, both of which form part of the system of the present invention.

In accordance with a preferred embodiment of the present invention, session data, including but not normally limited to session content data (SCND) relating to the content of a communications session between a user, employing communicator 10, and a content/application provider, employing server 20, is communicated from a content server data module (CSDM) 40. The session data supplied by the CSDM normally includes CSDM session communications data (CSDM/SCMD) relating inter alia to the identity of one or more intermediaries communicating with server 20.

Throughout this application, the term "session" is used to denote a user request for a given URL and the response of a content/application server to that request by downloading data to a user.

Whenever a user wishes to access a web site, the user submits via communicator 10 a request to server 20 for a certain web page. The parameters of this request typically include the URL of the requested page and the user's Internet address. In addition, in certain cases, a user password is provided with the request. Interactive activities between the user and server 20, such as purchases of goods or services, involve multiple requests each having corresponding request parameters.

The CSDM 40 normally receives from server 20 the above request parameters as well as possibly certain user information evoked by receipt of the password. The CSDM analyzes all of this interactive information, including the request parameters, on the
basis of predetermined criteria and produces, as the result of this analysis, the session content data (SCND).

An example of the foregoing is a purchase of a given product by a user in the course of which purchase various information regarding the request, the product, the purchase amount, the user and the user's entitlements, such as discount entitlements, are either provided to the server 20 by the user's request or are made available to the server by the application employed at the server following entry of the user's password. All or part of this information is supplied by the server 20 to the CSDM 40 and may be employed by the CSDM in providing the session content data (SCND) or forming part thereof.

Additionally or alternatively, the SCND data may include information regarding a type of content, such as, for example, whether the content is MP3, e-mail or HTML; a cost to the user for the content, revenue sharing information, such as, for example, the entitlement of a certain entity to a commission on a transaction between a certain user and a certain web site; content packet count; and session timing information.

Session data regarding the same session is obtained from the intermediary 30 by an intermediary data module (INDM) 50. This session data, which, in a end-to-end secure communications environment normally does not contain content data, is here termed INDM session communications data (INDM/SCMD). Normally the INDM 50 receives INDM/SCMD data for all sessions involving the intermediary 30.

Normally both CSDM/SCMD and INDM/SCMD data each include partial session communications data, which include overlapping elements. Only a combination of the partial session communications data received from CSDM 40 and INDM 50 provides sufficient information which enables desired linking of the session content data with a given user, communicator or intermediary involved in the session.

A service center (SC) 60 receives the SCND and CSDM/SCMD data from the CSDM 40 and employs the CSDM/SCMD data to interrogate an INDM 50 which corresponds to a given intermediary 30 through which a given session involving a server 20 took place.
Based on that interrogation, CSDM/SCMD data for a given session, received from the CSDM 40, and INDM/SCMD data for the same session, received from the intermediary 30, is correlated, typically at an INDM 50, to provide correlated session information to the SC 60, which may use the SCND and correlated session communications data (SCMD) for various commercial purposes. Alternatively or additionally, some or all of the correlation may be carried out at the SC 60. The correlated session information may be supplied by the service center to authorized entities requesting such information.

It is a particular feature of the present invention that the system described hereinabove with reference to Fig. 1 normally operates automatically and does not require involvement of an operator, except for initial set-up as described hereinafter.

It is also a particular feature of the present invention that the methodology described hereinabove with reference to Fig. 1 is capable of providing the following functionalities:

A. Revenue sharing between entities in the value chain between the user and the content/application provider such as an intermediary 30. For example, an intermediary may wish to receive a commission on transactions effected by a user through it. In such a case, the information relating to the transactions may be included in the SCND data.

B. Billing to a user for transactions between a user and a content/application provider which is effected by an entity in the value chain between the user and the content/application provider such as an intermediary 30. For example, an intermediary may bill a user for transactions effected by a user through it. In such a case, the information relating to the transactions may be included in the SCND data.

C. Content-based billing for Internet access charges to a user for content/applications provided to a user by a content/application provider. In contrast to conventional billing methodologies, the content-based billing for Internet access charges may be independent of access time or the number of packets downloaded. For example, an intermediary 30 may bill a user for Internet access as a function of the content or application supplied to the user. In such a case, the information providing a basis for the content-based billing may be included in the SCND data.
D. Composite content-based billing for Internet access charges to a user for content/applications provided to a user by a content/application provider. In contrast to conventional billing methodologies, content-based billing for Internet access charges may be integrated with billing based on access time and/or the number of packets downloaded. For example, an intermediary 30 may bill a user for Internet access as a function of the type of content or application supplied to the user as well as one or more of access time and packet count. In such a case, the information providing a basis for the composite content-based billing may be included in the SCND data.

E. Subsidizing Internet access for users, as described hereinafter with reference to Figs. 9 and 10A-10F.

Typically the communications between a CSDM 40 and a content/application server 20 as well as communications between an INDM 50 and an intermediary 30 are effected either via a LAN or by a direct point-to-point connection.

Typically the communications between service center 60 and a CSDM 40 and an INDM 50 are carried by the Internet, by a private IP network, by a virtual private IP network (VPN) or by any other suitable communications channel having appropriate security against fraud and in a manner which minimizes opportunity for repudiation of transactions by users.

Typically the communications between service center 60 and a CSDM 40 and an INDM 50 are carried on a session by session basis in real-time or near real-time or on a batch basis from time to time as appropriate.

Reference is now made to Fig. 2, which is a simplified block diagram illustration of a preferred embodiment of the invention in a wireless-Internet environment such as, for example, a cellular-Internet environment. As seen in Fig. 2, a wireless-Internet communicator 110, such as a WAP enabled telephone, communicates at least partially along the Internet via plural intermediaries, with a content/application server 112.

In the illustrated embodiment of Fig. 2, the wireless-Internet communicator 110 communicates via a wireless network 114, which is typically a circuit switched data (CSD) network or a packet data (PD) network, with an Internet Point of Presence (POP) 116 which, in turn, communicates with a wireless-Internet gateway 118, such as a WAP
gateway. The wireless-Internet gateway 118 communicates via the Internet and optionally or alternatively via a LAN or a WAN with a desired content/application server 112, which may be a wireless-enabled server such as a WAP-enabled server, or a non-wireless-enabled server. It is appreciated that a portal server 120 may be involved in the communication between wireless-Internet communicator 110 and content/application server 112 by providing a link leading to such communication.

It is to be appreciated that there exist a plurality of POPs 116, a plurality of wireless-Internet gateways 118 and a plurality of portal servers 120, each of which may or may not form part of the system of the present invention. Similarly, there exist a multiplicity of content/application servers 112, each of which may or may not form part of the system of the present invention. For the sake of conciseness and clarity, the description of the present invention relates to a situation where an Internet communicator 110 communicates with a content/application server 112 via at least one of a POP 116, a wireless-Internet gateway 118 and a portal server 120, all of which form part of the system of the present invention.

In accordance with a preferred embodiment of the present invention illustrated in Fig. 2, session data, including but not normally limited to session content data (SCND) relating to the content of a communications session between a user, employing communicator 110, and a content/application provider, employing server 112, is communicated from a content server data module (CSDM) 140. The session data supplied by the CSDM normally includes CSDM session communications data (CSDM/SCMD) relating inter alia to the identity of one or more intermediaries communicating with server 112. The CSDM session communications data (CSDM/SCMD) typically includes one or more of the following types of information relating to each session:

A1. the URL requested during the session;

B1. the referrer URL, such as a URL of a portal server 120;

C1. the IP address assigned to the user for the session, as identified by server 112;

D1. total time duration of the session as measured at server 112;
E1. total number of bytes received by server 112 from the wireless-Internet communicator 110 as a session request, as identified at server 112;

F1. total number of bytes sent by server 112 to the wireless-Internet communicator 110 in response to the session request, as identified at server 112;

G1. the time stamp assigned to the session by server 112;

H1. the IP address assigned to the request by a firewall protecting the wireless-Internet gateway;

I1. the IP address of the wireless-Internet gateway 118 as identified by server 112; and

J1. an identifier assigned by the wireless-Internet gateway 118 to the session. Such identifier may typically include a user ID and/or the telephone number of the wireless-Internet communicator 110.

In accordance with a preferred embodiment of the present invention communication data regarding all sessions handled by a wireless-Internet gateway 118, which forms part of the system of the present invention, hereinafter termed GWDM/SCMD, is supplied to a gateway data module (GWDM) 142. This data typically includes one or more of the following types of information relating to each session:

K1. the IP address of the content/application server 112 as identified by gateway 118;

L1. the URL requested during the session;

M1. the referrer URL, such as a URL of a portal server 120;

N1. the IP address assigned to the user for the session;

O1. total time duration of the session as measured at gateway 118;

P1. total number of bytes sent to server 112 from the wireless-Internet communicator 110 as a session request, as identified at gateway 118;

Q1. total number of bytes sent by server 112 to the wireless-Internet communicator 110 in response to the session request, as identified at gateway 118;
R1. the IP address assigned to the request by a firewall protecting the wireless-Internet gateway;

S1. the identifier assigned by the wireless-Internet gateway 118 to the session;

T1. the time stamp assigned to the session by gateway 118; and

U1. the telephone number of the wireless-Internet communicator 110, as identified by gateway 118.

Similarly data regarding all sessions handled by a POP 116, which forms part of the system of the present invention, hereafter termed POP/SCMD, is supplied to a POP data module (PPDM) 144. This data typically includes one or more of the following types of information relating to each session:

V1. the IP address assigned to the user for the session;

W1. total time duration of the session, as measured at POP 116;

X1. the time stamp assigned to the session by POP 116; and

Y1. the telephone number of the wireless-Internet communicator 110 as identified by POP 116.

Similarly data regarding sessions handled by a portal server 120, which forms part of the system of the present invention, hereafter termed PTDM/SCMD, is supplied to a portal data module (PTDM) 146. Session data is typically supplied only for sessions which effected a link to another web site. This data typically includes one or more of the following types of information relating to each session:

Z1. the URL of the portal 120 which effected the session between the wireless-Internet communicator 110 and a content/application server 112;

AA1. the IP address assigned to the user for the session as identified at portal server 120;

BB1. the time stamp assigned to the session by portal server 120;

CC1. the IP address of the wireless-Internet gateway 118 as identified by portal server 120; and

DD1. the identifier assigned by the wireless-Internet gateway 118 to the session.
The GWDM 142, the PPDM 144 and the PTDM 146 are specific examples of an INDM (intermediary data module) 50 (Fig. 1). The data supplied by the GWDM 142, the PPDM 144 and the PTDM 146 which, in a end-to-end secure communications environment normally does not contain content data, is here termed session communications data (SCMD).

Whenever a user wishes to access a web site, the user submits via communicator 110 a request to server 112 for a certain web page. The parameters of this request typically include the URL of the requested page and the user Internet address. In addition, in certain cases, a user password is provided with the request. Interactive activities between the user and server 112, such as purchases of goods or services, involve multiple requests each having corresponding request parameters.

The CSDM 140 normally receives from server 112 the above request parameters as well as possibly certain user information evoked by receipt of the password. The CSDM analyzes all of this interactive information, including the request parameters, on the basis of predetermined criteria and automatically produces, as the result of this analysis, the session content data (SCND).

An example of the foregoing is a purchase of a given product by a user in the course of which purchase various information regarding the request, the product, the purchase amount, the user and the user's entitlements, such as discount entitlements, are either provided to the server 112 by the user's request or are made available to the server by the application employed at the server following entry of the user's password. All or part of this information is supplied by the server 112 to the CSDM 140 and may be employed by the CSDM in providing the session content data (SCND) or may form part thereof.

Additionally or alternatively, the SCND may include information regarding a type of content, such as, for example, whether the content is MP3, e-mail, HTML or WML; a cost to the user for the content, revenue sharing information, such as, for example, the entitlement of a certain entity such as a wireless network operator to a commission on a transaction between a certain user and a certain web site; content packet count; and session timing information.
Session content data (SCND) and session communications data (CSDM/SCND) is supplied from CSDM 140 to a service center (CS) 150, which corresponds to SC 60 (Fig. 1). Session communications data (SCMD) is supplied by GWDM 142, PPDM 144 and PTDM 146 to service center 150 in a manner which is described hereinbelow:

It is to be appreciated that the number of sessions handled by the POP 116, the wireless-Internet gateway 118 and the portal 120 each normally greatly exceed the number of sessions handled by a given content/application server 112, possibly by many orders of magnitude. Accordingly, in accordance with a preferred embodiment of the invention, for each session for which session content data is supplied by CSDM 140 to service center 150, the service center 150 interrogates the appropriate GWDM 142 to obtain additional session communication data therefrom and may also interrogate the PPDM 144 and/or the PTDM 146 to obtain further session communication data therefrom.

Typically the service center employs session communication data (CSDM/SCMD) forming part of the session data received from CSDM 140 to provide a basis for interrogation of GWDM 142 and to identify the appropriate GWDM 142 to interrogate. As noted above, the CSDM/SCMD data typically includes one or more items of information designated above as A1. - J1. Some or all of this information may be communicated to the GWDM 142 as part of the interrogation request (GWDM/IR) formulated by service center 150, which is communicated to the GWDM 142. Item I1. is typically used by the service center 150 to identify the appropriate GWDM 142 to be interrogated regarding a given session. The service center 150 typically maintains a look-up table which links the IP addresses of various wireless-Internet gateways 118 with the IP addresses of corresponding GWDMs 142.

When the GWDM 142 receives an interrogation request, it scans through the GWDM/SCMD data received by it from the corresponding wireless-Internet gateway 118 relating to a typically very large number of sessions, most of which are totally unrelated to the sessions with respect to which CSDM/SCMD data is supplied to the service center by CSDM 140.
As the result of the scanning, the GWDM matches GWDM/SCMD data having typically at least items S1. and T1. which correspond respectively to at least items J1. and G1. in CSDM/SCMD data received from CSDM 140 and adds at least item U1. thereto. In this way, item U1. relating to each of the sessions in which SCND is created and in which the wireless-Internet gateway 118 is involved, is correlated with the SCND data for each such session.

Where appropriate, the service center 150 typically employs session communication data (CSDM/SCMD and/or GWDM/SCMD), forming part of the session data received from CSDM 140 and/or GWDM 142 to provide a basis for formulating an interrogation request (PPDM/IR) which is communicated to the PPDM 144 and for identifying the appropriate PPDM 144 to interrogate. As noted above, the CSDM/SCMD data and GWDM/SCMD data typically include one or more items of information designated above as A1. - U1. Some or all of this information may be communicated to the PPDM 144 as part of the interrogation request (PPDM/IR) formulated by service center 150, which is communicated to the PPDM 144. Item C1. is typically used by the service center 150 to identify the appropriate PPDM 144 to be interrogated regarding a given session. The service center 150 typically maintains a look-up table which links all the IP addresses used by a POP 116 for assignment to users to a given POP 116 and links the given POP 116 to the IP address of a corresponding PPDM 144.

When the PPDM 144 receives an interrogation request, it scans through the PPDM/SCMD data received by it from the POP 116 relating to a typically very large number of sessions, most of which are totally unrelated to the sessions with respect to which CSDM/SCMD data is supplied to the service center by CSDM 140.

As the result of the scanning, the PPDM matches PPDM/SCMD data having typically at least items V1. and X1. which correspond typically to at least items N1. and T1. and adds item Y1. thereto. In this way, item Y1., relating to each of the sessions in which SCND is created and in which the POP 144 is involved, is correlated with the SCND data for each such session. It is appreciated that item U1., which is identical to item Y1., may not be available in certain cases from the GWDM. This is true, for
example when the corresponding wireless-Internet gateway 118 operates in an "anonymous mode".

Where appropriate, the service center 150 typically employs session communication data (CSDM/SCMD and/or GWDM/SCMD and/or PPDM/SCMD), forming part of the session data received from CSDM 140 and/or GWDM 142 and/or PPDM 144 in formulating an interrogation request (PTDM/IR) which is communicated to the PTDM 146 and in identifying the appropriate PTDM 146 to interrogate. As noted above, the CSDM/SCMD, GWDM/SCMD and PPDM/SCMD data typically include one or more items of information designated above as A1. - Y1. Some or all of this information may be communicated to the PTDM 146 as part of the interrogation request (PTDM/IR) formulated by service center 150, which is communicated to the PTDM 146.

Item B1. is typically used by the service center 150 to identify the appropriate PTDM 146 to be interrogated regarding a given session. The service center 150 typically maintains a look-up table which links URLs to given portal servers 120 and links a given portal server 120 to the IP address of a corresponding PTDM 146.

When the PTDM 146 receives an interrogation request, it scans through the PTDM/SCMD data received by it from the portal server 120 relating to a typically very large number of sessions, most of which are totally unrelated to the sessions with respect to which CSDM/SCMD data is supplied to the service center by CSDM 140.

As the result of the scanning, the PTDM matches PTDM/SCMD data having typically at least items Z1., BB1. and DD1., which correspond typically to at least items B1., G1. and J1. which were earlier associated with specific sessions in CSDM/SCMD data received from CSDM 140.

It is appreciated that the multi-stage matching carried out with respect to data at various intermediaries along the communication link between the wireless-Internet communicator 110 and the content/application server 112 provides a powerful tool to detect and thus eliminate fraud which could be perpetrated by supplying false data at one or more points along the communication link.
It is also appreciated that the multi-location data collection and the multi-stage matching carried out with respect to such collected data at various intermediaries along the communication link between the wireless-Internet communicator 110 and the content/application server 112 provides a powerful tool for confirming the participation of such intermediaries in the communication link.

In certain cases, no response or an insufficient response is received from one or more of the intermediaries along the communication link. In such cases, interrogation of additional intermediaries becomes important where otherwise it might not have been necessary.

It is also appreciated that not all of the data items A1. – DD1., referred to above may be useful or necessary for proper operation of the system and method of the present invention. In a typical situation, aside from the issues of fraud protection and intermediary participation confirmation, only items C1., N1. or V1. and items U1. or Y1. and their association with SCND data corresponding to a given session, may have commercial significance. As noted above, item C1., N1. or V1. provide information regarding the identity of the POP. The identity of the POP typically identifies the wireless ISP and possibly the operator of the wireless network 114.

It is to be appreciated that the CSDM/SCMD data typically include data item J1. which may be configured by the operator of gateway 118 to include the telephone number of the wireless-Internet communicator 110. In this case, aside from the issues of fraud protection and intermediary participation confirmation, there might not be a need to obtain further information from a GWDM 142, a PPDM 144 or a PTDM 146 and the SCND and CSDM/SCMD data provided by the CSDM 140 to service center 150 may be sufficient for proper operation thereof.

Typically the communications between a CSDM 140 and a content/application server 112, a GWDM 142 and a wireless-Internet gateway 118, a PPDM 144 and a POP 116 and a PTDM 146 and a portal server 120 are effected either via a LAN or by a direct point-to-point connection.

Typically the communications between the service center 150 and the CSDM 140, the GWDM 142, the PPDM 144 and the PTDM 146 are carried by the Internet, by
a private IP network, by a virtual private IP network (VPN) or by any other suitable communications channel having appropriate security against fraud and in a manner which minimizes opportunity for repudiation of transactions by users.

Typically the communications between the service center 150 and the CSDM 140, the GWDM 142, the PPDM 144 and the PTDM 146 are carried on a session by session basis in real-time or near real-time or on a batch basis from time to time as appropriate.

It is to be appreciated that for the purpose of correlating event timestamps recorded at CSDM 140, GWDM 142, PPDM 144 and PTDM 146, the service center 150, as well as CSDM 140, GWDM 142, PPDM 144 and PTDM 146 preferably utilize a synchronization mechanism that from time to time provides them with an updated standard time indication such as the coordinated universal time (UTC).

It is also to be appreciated that the process of correlating event timestamps described hereabove, allow for a predetermined tolerance resulting from transmission delays along the communications link between the content/application server 112 and the wireless-Internet communicator 110.

The present invention, as described hereinabove with respect to Fig. 2 thus enables the following information to be unambiguously associated with the SCND data for each session at the server 112:

I. The telephone number of the wireless-Internet communicator 110;

II. The permanent local wireless network operator to which the wireless-Internet communicator 110 subscribes;

III. The wireless ISP through which the wireless-Internet communicator 110 communicates for a given session;

IV. The actual wireless network operator through which the wireless-Internet communicator 110 communicates for a given session;

V. The operator of the wireless-Internet gateway 120 through which the wireless-Internet communicator 110 communicates for a given session; and
VI. The identity of the portal 120 that provides a link used to initiate a given session.

Item I is known from either items U1. or Y1. above.

Item II is known from the prefix of item I.

Item III is known from any of items C1., N1. or V1. above.

Item IV is known either from any of items C1., N1. or V1. above, possibly also employing information received from the ISP.

Item V is known from item II. above.

Item VI is known from either items B1., M1. or Z1. above.

10 The foregoing information may be supplied by the service center to authorized entities requesting such information.

It is a particular feature of the present invention that the system described hereinabove with reference to Fig. 2 normally operates automatically without requiring involvement of an operator, except for initial set-up as described hereinafter.

15 It is also a particular feature of the present invention that the methodology described hereinabove with reference to Fig. 2 is capable of providing the following functionalities:

A. Revenue sharing between entities in the value chain between the user and the content/application provider. These entities may include a wireless network operator, a wireless ISP which operates the POP and a portal. For example, a wireless network operator may wish to receive a commission on transactions effected by a user through its network. In such a case, the information relating to the transactions may be included in the SCND data.

B. Billing to a user for transactions between a user and a content/application provider which is effected by an entity in the value chain between the user and the content/application provider. The entity may be a wireless network operator, a wireless ISP which operates the POP and a portal. For example, a wireless network operator may bill a user for transactions effected by a user through its network. In such a case, the information relating to the transactions may be included in the SCND data.
C. Content-based billing for wireless-Internet access charges to a user for content/applications provided to a user by a content/application provider. In contrast to conventional billing methodologies, the content-based billing for wireless-Internet access charges may be independent of access time or the number of packets downloaded. For example, a wireless network operator may bill a user for wireless-Internet access as a function of the content or application supplied to the user. In such a case, the information providing a basis for the content-based billing may be included in the SCND data.

D. Composite content-based billing for wireless-Internet access charges to a user for content/applications provided to a user by a content/application provider. In contrast to conventional billing methodologies, content-based billing for wireless-Internet access charges may be integrated with billing based on access time and/or the number of packets downloaded. For example, a wireless network operator may bill a user for wireless-Internet access as a function of the type of content or application supplied to the user as well as one or more of access time and packet count. In such a case, the information providing a basis for the content-based billing may be included in the SCND data.

E. Subsidizing Internet access for users as described hereinafter with reference to Figs. 9 - 32B.

Reference is now made to Fig. 3, which is a simplified block diagram illustration of a preferred embodiment of the invention in an Internet environment. As seen in Fig. 3, an Internet communicator 210, such as a personal computer, communicates at least partially along the Internet via plural intermediaries, with a content/application server 212.

In the illustrated embodiment of Fig. 3, the Internet communicator 210 communicates with an Internet Point of Presence (POP) 216 which, in turn, communicates via the Internet and optionally or alternatively via a LAN or a WAN with a desired content/application server 212. It is appreciated that a portal server 220 may be involved in the communication between communicator 210 and content/application server 212 by providing a link leading to such communication.
It is to be appreciated that there exist a plurality of POPs 216 and a plurality of portal servers 220, each of which may or may not form part of the system of the present invention. Similarly, there exist a multiplicity of content/application servers 212, each of which may or may not form part of the system of the present invention. For the sake of conciseness and clarity, the description of the present invention relates to a situation where an Internet communicator 210 communicates with a content/application server 212 via at least one of a POP 216 and a portal server 220, both of which form part of the system of the present invention.

In accordance with a preferred embodiment of the present invention illustrated in Fig. 3, session data, including but not normally limited to session content data (SCND) relating to the content of a communications session between a user, employing communicator 210, and a content/application provider, employing server 212, is communicated from a content server data module (CSDM) 240. The session data supplied by the CSDM normally includes CSDM session communications data (CSDM/SCMD) relating inter alia to the identity of one or more intermediaries communicating with server 212. The CSDM session communications data (CSDM/SCMD) typically includes one or more of the following types of information relating to each session:

A2. the URL requested during the session;

B2. the referrer URL, such as a URL of a portal server 220;

C2. the IP address assigned to the user for the session, as identified by server 212;

D2. total time duration of the session as measured at server 212;

E2. total number of bytes received by server 212 from communicator 210 as a session request, as identified at server 212;

F2. total number of bytes sent by server 212 to communicator 210 in response to the session request, as identified at server 212;

G2. the time stamp assigned to the session by server 212;
H2. the IP address assigned to the request by a firewall protecting the POP 216 as identified by server 212;

In accordance with a preferred embodiment of the present invention communication data regarding all sessions handled by a POP 216, which forms part of the system of the present invention, hereafter termed POP/SCMD, is supplied to a POP data module (PPDM) 244. This data typically includes one or more of the following types of information relating to each session:

I2. the IP address assigned to the user for the session;

J2. total time duration of the session, as measured at POP 216; and

K2. the time stamp assigned to the session by POP 216.

Similarly data regarding sessions handled by a portal server 220, which forms part of the system of the present invention, hereafter termed PTDM/SCMD, is supplied to a portal data module (PTDM) 246. Session data is typically supplied only for sessions which effected a link to another web site. This data typically includes one or more of the following types of information relating to each session:

L2. the URL of the portal 220 which effected the session between the wireless-Internet communicator 210 and a content/application server 212;

M2. the IP address assigned to the user for the session as identified at portal server 220; and

N2. the time stamp assigned to the session by portal server 220.

The PPDM 244 and the PTDM 246 are specific examples of an INDM (intermediary data module) 50 (Fig. 1). The data supplied by the PPDM 244 and the PTDM 246 which, in an end-to-end secure communications environment normally does not contain content data, is here termed session communications data (SCMD).

Whenever a user wishes to access a web site, the user submits via communicator 210 a request to server 212 for a certain web page. The parameters of this request typically include the URL of the requested page and the user Internet address. In addition, in certain cases, a user password is provided with the request. Interactive
activities between the user and server 212, such as purchases of goods or services, involve multiple requests each having corresponding request parameters.

The CSDM 240 normally receives from server 212 the above request parameters as well as possibly certain user information evoked by receipt of the password. The CSDM analyzes all of this interactive information, including the request parameters, on the basis of predetermined criteria and automatically produces, as the result of this analysis, the session content data (SCND).

An example of the foregoing is a purchase of a given product by a user in the course of which purchase various information regarding the request, the product, the purchase amount, the user and the user's entitlements, such as discount entitlements, are either provided to the server 212 by the user's request or are made available to the server by the application employed at the server following entry of the user's password. All or part of this information is supplied by the server 212 to the CSDM 240 and may be employed by the CSDM in providing the session content data (SCND) or may form part thereof.

Additionally or alternatively, the SCND may include information regarding a type of content, such as, for example, whether the content is MP3, e-mail, HTML or WML; a cost to the user for the content, revenue sharing information, such as, for example, the entitlement of a certain entity such as an ISP to a commission on a transaction between a certain user and a certain web site; content packet count; and session timing information.

Session content data (SCND) and session communications data (CSDM/SCND) is supplied from CSDM 240 to a service center (CS) 250, which corresponds to SC 60 (Fig. 1). Session communications data (SCMD) is supplied by PPDM 244 and PTDM 246 to service center 250 in a manner which is described hereinbelow:

It is to be appreciated that the number of sessions handled by the POP 216 and the portal 220 each normally greatly exceed the number of sessions handled by a given content/application server 212, possibly by many orders of magnitude. Accordingly, in accordance with a preferred embodiment of the invention, for each session for which session content data is supplied by CSDM 240 to service center 250, the service center
250 interrogates the appropriate PPDM 244 to obtain additional session communication data therefrom and may also interrogate the PTDM 246 to obtain further session communication data therefrom.

 Typically the service center employs session communication data (CSDM/SCMD) forming part of the session data received from CSDM 240 to provide a basis for interrogation of PPDM 244 and to identify the appropriate PPDM 244 to interrogate. As noted above, the CSDM/SCMD data typically includes one or more items of information designated above as A2. – H2. Some or all of this information may be communicated to the PPDM 244 as part of the interrogation request (PPDM/IR) formulated by service center 250, which is communicated to the PPDM 244. Item C2. is typically used by the service center 250 to identify the appropriate PPDM 244 to be interrogated regarding a given session. The service center 250 typically maintains a look-up table which links all the IP addresses used by a POP 216 for assignment to users to a given POP 216 and links the given POP 216 to the IP address of a corresponding PPDM 244.

 When the PPDM 244 receives an interrogation request, it scans through the PPDM/SCMD data received by it from the POP 216 relating to a typically very large number of sessions, most of which are totally unrelated to the sessions with respect to which CSDM/SCMD data is supplied to the service center by CSDM 240.

 As the result of the scanning, the PPDM matches PPDM/SCMD data having typically at least items I2. and K2. which correspond typically to at least items C2. and G2.

 Where appropriate, the service center 250 typically employs session communication data (CSDM/SCMD and/or PPDM/SCMD), forming part of the session data received from CSDM 240 and/or PPDM 244 in formulating an interrogation request (PTDM/IR) which is communicated to the PTDM 246 and in identifying the appropriate PTDM 246 to interrogate. As noted above, the CSDM/SCMD and PPDM/SCMD data typically include one or more items of information designated above as A2. – K2. Some or all of this information may be communicated to the PTDM 246 as
part of the interrogation request (PTDM/IR) formulated by service center 250, which is communicated to the PTDM 246.

Item B2. is typically used by the service center 250 to identify the appropriate PTDM 246 to be interrogated regarding a given session. The service center 250 typically maintains a look-up table which links URLs to given portal servers 220 and links a given portal server 220 to the IP address of a corresponding PTDM 246.

When the PTDM 246 receives an interrogation request, it scans through the PTDM/SCMD data received by it from the portal server 220 relating to a typically very large number of sessions, most of which are totally unrelated to the sessions with respect to which CSDM/SCMD data is supplied to the service center by CSDM 240.

As the result of the scanning, the PTDM matches PTDM/SCMD data having typically at least items L2. and M2., which correspond typically to at least items B2. and G2. which were earlier associated with specific sessions in CSDM/SCMD data received from CSDM 240.

It is appreciated that the multi-stage matching carried out with respect to data at various intermediaries along the communication link between the wireless-Internet communicator 210 and the content/application server 212 provides a powerful tool to detect and thus eliminate fraud which could be perpetrated by supplying false data at one or more points along the communication link.

It is also appreciated that the multi-location data collection and the multi-stage matching carried out with respect to such collected data at various intermediaries along the communication link between the Internet communicator 210 and the content/application server 212 provides a powerful tool for confirming the participation of such intermediaries in the communication link.

In certain cases, no response or an insufficient response is received from one or more of the intermediaries along the communication link. In such cases, interrogation of additional intermediaries becomes important where otherwise it might not have been necessary.
Typically the communications between a CSDM 240 and a content/application server 212, a PPDM 244 and a POP 216 and a PTDM 246 and a portal server 220 are effected either via a LAN or by a direct point-to-point connection.

Typically the communications between the service center 250 and the CSDM 240, the PPDM 244 and the PTDM 246 are carried by the Internet, by a private IP network, by a virtual private IP network (VPN) or by any other suitable communications channel having appropriate security against fraud and in a manner which minimizes opportunity for repudiation of transactions by users.

Typically the communications between the service center 250 and the CSDM 240, the PPDM 244 and the PTDM 246 are carried on a session by session basis in real-time or near real-time or on a batch basis from time to time as appropriate.

It is to be appreciated that for the purpose of correlating event timestamps recorded at CSDM 240, PPDM 244 and PTDM 246, the service center 250, as well as CSDM 240, PPDM 244 and PTDM 246 preferably utilize a synchronization mechanism that from time to time provides them with an updated standard time indication such as the coordinated universal time (UTC).

It is also to be appreciated that the process of correlating event timestamps described hereabove, allow for a predetermined tolerance resulting from transmission delays along the communications link between the content/application server 212 and the Internet communicator 210.

The present invention, as described hereabove with respect to Fig. 3 thus enables the following information to be unambiguously associated with the SCND data for each session at the server 212:

I. The wireless ISP through which the wireless-Internet communicator 210 communicates for a given session; and

II. The identity of the portal 220 that provides a link used to initiate a given session.

Item I is known from either items C2. or I2. above.

Item II is known from either items B2. or L2. above.
The foregoing information may be supplied by the service center to authorized entities requesting such information.

It is a particular feature of the present invention that the system described hereinabove with reference to Fig. 3 normally operates automatically without requiring involvement of an operator, except for initial set-up as described hereinafter.

It is also a particular feature of the present invention that the methodology described hereinabove with reference to Fig. 3 is capable of providing the following functionalities:

A. Revenue sharing between entities in the value chain between the user and the content/application provider. These entities may include an ISP which operates the POP and/or a portal. For example, an ISP may wish to receive a commission on transactions effected by a user through its network. In such a case, the information relating to the transactions may be included in the SCND data.

B. Billing to a user for transactions between a user and a content/application provider which is effected by an entity in the value chain between the user and the content/application provider. The entity may be an ISP which operates the POP and/or a portal. For example, an ISP may bill a user for transactions effected by a user through its network. In such a case, the information relating to the transactions may be included in the SCND data.

C. Content-based billing for Internet access charges to a user for content/applications provided to a user by a content/application provider. In contrast to conventional billing methodologies, the content-based billing for Internet access charges may be independent of access time or the number of packets downloaded. For example, an ISP may bill a user for Internet access as a function of the content or application supplied to the user. In such a case, the information providing a basis for the content-based billing may be included in the SCND data.

D. Composite content-based billing for Internet access charges to a user for content/applications provided to a user by a content/application provider. In contrast to conventional billing methodologies, content-based billing for Internet access charges may be integrated with billing based on access time and/or the number of packets
downloaded. For example, an ISP may bill a user for Internet access as a function of the type of content or application supplied to the user as well as one or more of access time and packet count. In such a case, the information providing a basis for the content-based billing may be included in the SCND data.

E. Subsidizing Internet access for users as described hereinafter with reference to Figs. 9 -32B.

Reference is now made to Fig. 4, which is a simplified block diagram illustration of a content/application server data module (CSDM) useful in the invention described hereinabove with reference to Figs. 1 - 3. As seen in Fig. 4, and explained hereinabove in regards to Fig. 1, the CSDM 40 (Fig. 1) receives from the content/application server session data including session communications data (CSDM/SCMD) and user request and interaction information.

The CSDM typically comprises a CSDM content data generator 302 which receives the session data. The CSDM content data generator 302 retrieves from a CSDM database 304 decision criteria for enabling the CSDM content data generator 302 to provide appropriate CSDM session content data (SCND) in response to the session data received thereby.

The CSDM database is preferably pre-loaded with data via a CSDM management subsystem 306, which data indicates what SCND data is to be generated for each combination of session data. The SCND data may vary depending on a wide range of parameters, including for example, the identity of the user, the identity of the content/application provider, the type of content or application requested, the existence and nature of revenue sharing or other arrangements between the content/application provider and other entities in a value chain extending between the user and the content/application provider and typically including a communications network operator, a wireless network operator, an internet service provider (ISP), a wireless-Internet gateway operator and a portal operator.

Some examples of the data retrieved by the CSDM content data generator 302 from the CSDM database 304 are given hereinbelow:
A. The existence and details of a revenue sharing agreement between the content/application provider operating a given content/application server and any entity in the value chain, such as a wireless network operator.

B. Designation by the content provider operating a given content/application server of a given user as having certain entitlements.

C. Designation by the content/application provider operating a given content/application server of given times or dates for providing certain entitlements to certain users under certain circumstances.

The CSDM content data generator 302, using the decision criteria retrieved from CSDM database 304, analyzes the session data received from the content/application server and generates appropriate SCND data.

For the sake of illustration, referring to examples A, B and C, given hereinabove, the following examples of SCND data may be generated:

A. An amount of purchase.

B. A discount level.

C. A notification of a user entitlement to refund on communications charges incurred in the session.

It is to be appreciated that the SCND is automatically generated by the CSDM content data generator 302, according to a predetermined criteria, in a process which does not require any involvement by an operator, except for initial set-up.

The SCND data generated by generator 302 is preferably combined with the CSDM/SCMD data received from the content/application server 20 and is stored in the CSDM database 304.

The combined SCND data and CSDM/SCMD data for one or more sessions is communicated by a CSDM messaging subsystem 308, typically as and when predetermined by the CSDM management subsystem 306, from the database 304, via a CSDM security subsystem 310, to the service center. The CSDM security subsystem 310 operates preferably according to criteria predetermined by the CSDM management subsystem 306 and stored at the CSDM database 304.
Reference is now made to Fig. 5, which is a simplified block diagram illustration of a gateway data module (GWDM) such as GWDM 142 useful in the invention described hereinabove with reference to Fig. 2. As seen in Fig. 5, the GWDM continuously receives from the wireless-Internet gateway, GWDM/SCMD data for all sessions handled by the GWDM.

The GWDM typically comprises a GWDM database 320 which receives and stores some or all of the GWDM/SCMD data provided by the gateway.

At times determined by the service center 150 (Fig. 2), an interrogation request (GWDM/IR) is sent by the service center via a GWDM security subsystem 322 to a GWDM data correlator 324, requesting GWDM/SCMD data relating to one or more sessions identified by the service center. The requested GWDM/SCMD data is retrieved by the GWDM data correlator 324 from the GWDM database 320 and correlated thereat with the CSDM/SCMD data included in the interrogation request. The correlated data is supplied by correlator 324 to a GWDM messaging subsystem 326, which in turn, supplies it as and when predetermined by a GWDM management subsystem 328, via the GWDM security subsystem 322, to the service center. The service center thus correlates the correlated GWDM/SCMD data with the SCND data received from the content/application server.

The GWDM management subsystem 328 provides predetermined criteria for the operation of the GWDM security subsystem 322 and the GWDM messaging subsystem 326, which is being stored at the GWDM database 320.

It is appreciated that the GWDM database 320 is preferably cleared of unnecessary information as and when determined by the GWDM management subsystem 328.

Reference is now made to Fig. 6, which is a simplified block diagram illustration of a POP data module (PPDM) such as PPDM 144 (Fig. 2), useful in the invention described hereinabove with reference to Figs. 2 and 3. As seen in Fig. 6, the PPDM continuously receives from the POP, PPDM/SCMD data for all sessions handled by the POP.
It is to be appreciated that an Internet point of presence (POP) is typically comprised of various elements which in combination, provide the necessary functionality for providing access to the Internet. Such element may be (not shown in Fig. 6) a remote access server (RAS), a remote authentication dial-in user server (RADIUS) and a domain name server (DNS).

The PPDM typically comprises a PPDM database 340 which receives and stores some or all of the PPDM/SCMD data provided by the POP.

At times determined by the service center 150 (Fig. 2), an interrogation request (PPDM/IR) is sent by the service center via a PPDM security subsystem 342 to a PPDM data correlator 344, requesting PPDM/SCMD data relating to one or more sessions identified by the service center. The requested PPDM/SCMD data is retrieved by the PPDM data correlator 344 from the PPDM database 340 and correlated thereat with the CSDM/SCMD and possibly GWDM/SCMD data included in the interrogation request. The correlated data is supplied by correlator 344 to a PPDM messaging subsystem 346, which in turn, supplies it as and when predetermined by a PPDM management subsystem 348, via the PPDM security subsystem 342, to the service center. The service center thus correlates the correlated PPDM/SCMD data with the SCND data received from the content/application server.

The PPDM management subsystem 348 provides predetermined criteria for the operation of the PPDM security subsystem 342 and the PPDM messaging subsystem 346, which is being stored at the PPDM database 340.

It is appreciated that the PPDM database 340 is preferably cleared of unnecessary information as and when determined by the PPDM management subsystem 348.

Reference is now made to Fig. 7, which is a simplified block diagram illustration of a portal server data module (PTDM) such as PTDM 146 (Fig. 2), useful in the invention described hereinabove with reference to Figs. 2 and 3. As seen in Fig. 7, the PTDM 146 continuously receives from the portal server, PTDM/SCMD data for sessions handled by the portal server and which provide links to other web sites.
The PTDM typically comprises a PTDM database 360 which receives and stores some or all of the PTDM/SCMD data provided by the portal server.

At times determined by the service center 150 (Fig. 2), an interrogation request (PTDM/IR) is sent by the service center via a PTDM security subsystem 362 to a PTDM data correlator 364, requesting PTDM/SCMD data relating to one or more sessions identified by the service center. The requested PTDM/SCMD data is retrieved by the PTDM data correlator 364 from the PTDM database 360 and correlated thereat with the CSDM/SCMD and possibly GWDM/SCMD and/or PPDM/SCMD data included in the interrogation request. The correlated data is supplied by correlator 364 to a PTDM messaging subsystem 366, which in turn, supplies it as and when predetermined by a PTDM management subsystem 368, via the PTDM security subsystem 362, to the service center. The service center thus correlates the correlated PTDM/SCMD data with the SCND data received from the content/application server.

The PTDM management subsystem 368 provides predetermined criteria for the operation of the PTDM security subsystem 362 and the PTDM messaging subsystem 366, which is being stored at the PTDM database 360.

It is appreciated that the PTDM database 360 is preferably cleared of unnecessary information as and when determined by the PTDM management subsystem 368.

Reference is now made to Fig. 8, which is a simplified block diagram illustration of a service center useful in the invention described hereinabove with reference to Figs. 1 - 3. As seen in Fig. 8, service center, here designated by reference numeral 400, intermittently receives SCND and CSDM/SCMD data from a plurality of CSDMs, GWDM/SCMD data from a plurality of GWDMs, PPDM/SCMD data from a plurality of PPDMs and PTDM/SCMD data from a plurality of PTDMs. This data is preferably received via a service center security subsystem 402 and is preferably supplied to an Session Data Record (SDR) generator 404, which compiles Session Data Records for each session reported by a CSDM based on incomplete information contained in the corresponding CSDM/SCMD data, which is complemented and completed by
information contained in one or more of the GWDM/SCMD data, PPDM/SCMD data and PTDM/SCMD data.

The output of the SDR generator 404, which contains all received information for each session reported by a CSDM, is stored in a service center database 406. The service center also maintains additional relevant information relating to all the value chain entities involved with the operation of the system of the present invention and to their specific information requirements from the system, as well as relevant information relating to all CSDMs, GWDMs, PPDMs and PTDMs, including, but not limited to, their set-up information.

All the above information is made available to a billing/clearing subsystem 408, which generates specific session data records (SSDRs) for transmission to various entities in the value chain as appropriate. Preferably the specific session data records are sent only to those entities who have a "need to know" based on their commercial relationship with the content/application provider and contain, in each case, only that portion of the information in the SDR which is required by each such entity.

The SSDRs preferably are communicated to the appropriate entities via an SC messaging subsystem 410 and via SC security subsystem 402.

The SC management subsystem 412 provides predetermined criteria for the operation of the SC security subsystem 402, the SC messaging subsystem 410, the SDR generator 404 and the billing/clearing subsystem 408, which is being stored at the SC database 406.

It is appreciated that the SC database 406 is preferably cleared of unnecessary information as and when determined by the SC management subsystem 412.

Reference is now made to Figs. 9, 10A–10F and 11 which illustrate a preferred mode of operation of the system and methodology of the present invention which provides a subsidized access wireless-Internet environment.

Subsidized cost wireless-Internet access, hereinafter termed "WI-800" is provided in accordance with a preferred embodiment of the present invention. While having certain similarities to the conventional 1-800 service which is well known in
traditional land based telephony, the WI-800 functionality provided by the present invention meets technological and other challenges not posed by the conventional service.

A principal difficulty in extending the traditional 1-800 service to wireless-Internet is the fact that, particularly in end-to-end secure Internet access environments, once a user is connected to the Internet, the wireless network operator has, until the present invention, no way of positively determining, which sites and which specific web pages in a site, the user is visiting and thus cannot allocate the wireless access charges among sites which subsidize wireless access and distinguish them from sites which do not.

There also exists in wireless-Internet an issue of potential fraud which is not present in the prior art conventional toll free services, which are administered by metering and billing systems of carriers and by inter carrier settlements. In a wireless-Internet environment, communication between a user and a content/application provider passes through the Internet which is a highly non-secure environment wherein the identity and existence of parties to the communication may not readily be discerned.

Reference is now made to Fig. 9, which is a simplified block diagram illustration of a preferred embodiment of the invention configured for operation in a subsidized access wireless-Internet environment. The embodiment of Fig. 9 thus describes a particular embodiment of the general structure shown in Fig. 2 and described hereinabove. Unless indicated otherwise or inappropriate, the general description of Fig. 2 which appears hereinabove also applies to the embodiment of Fig. 9. As seen in Fig. 9, a wireless-Internet communicator 510, such as a WAP enabled telephone, communicates at least partially along the Internet via plural intermediaries, with a content/application server 512.

In the illustrated embodiment of Fig. 9, the wireless-Internet communicator 510 communicates via a wireless network 514, which is typically a circuit switched data (CSD) network or a packet data (PD) network, with an Internet Point of Presence (POP) 516 which, in turn, communicates with a wireless-Internet gateway 518, such as a WAP gateway. The wireless-Internet gateway 518 communicates via the Internet and
optionally or alternatively via a LAN or a WAN with a desired content/application server 512, which may be a wireless-enabled server such as a WAP-enabled server, or a non-wireless-enabled server.

It is to be appreciated that there exist a plurality of POPs 516 and a plurality of wireless-Internet gateways 518, each of which may or may not form part of the system of the present invention. Similarly, there exist a multiplicity of content/application servers 512, each of which may or may not form part of the system of the present invention. For the sake of conciseness and clarity, the description of the present invention relates to a situation where an Internet communicator 510 communicates with a content/application server 512 via at least one of a POP 516 and a wireless-Internet gateway 518, all of which form part of the system of the present invention.

In accordance with a preferred embodiment of the present invention illustrated in Fig. 9, session data, including but not normally limited to session content data (SCND) relating to the content of a communications session between a user, employing communicator 510, and a content/application provider, employing server 512, is communicated from a content server data module (CSDM) 540. The session data supplied by the CSDM normally includes CSDM session communications data (CSDM/SCMD) relating inter alia to the identity of one or more intermediaries communicating with server 512. The CSDM session communications data (CSDM/SCMD) typically includes one or more of the following types of information relating to each session:

A3. the URL requested during the session;
B3. the IP address assigned to the user for the session, as identified by server 512;
C3. total time duration of the session as measured at server 512;
D3. total number of bytes received by server 512 from the wireless-Internet communicator 510 as a session request, as identified at server 512;
E3. total number of bytes sent by server 512 to the wireless-Internet communicator 510 in response to the session request, as identified at server 512;
F3. the time stamp assigned to the session at server 512;

G3. the IP address assigned to the request by a firewall protecting the wireless-Internet gateway as identified by server 112;

H3. the IP address of the wireless-Internet gateway 518 as identified by server 512; and

I3. an identifier assigned by the wireless-Internet gateway 518 to the session. Such identifier may typically include a user ID and/or the telephone number of the wireless-Internet communicator 510.

In accordance with a preferred embodiment of the present invention, communication data regarding all sessions handled by a wireless-Internet gateway 518, which forms part of the system of the present invention, hereinafter termed GWDM/SCMD, is supplied to a gateway data module (GWDM) 542. This data typically includes one or more of the following types of information relating to each session:

J3. the IP address of the content/application server 512 as identified by gateway 518;

K3. the URL requested during the session;

L3. the IP address assigned to the user for the session;

M3. total time duration of the session as measured at gateway 518;

N3. total number of bytes sent to server 512 from the wireless-Internet communicator 510 as a session request, as identified at gateway 518;

O3. total number of bytes sent by server 512 to the wireless-Internet communicator 510 in response to the session request, as identified at gateway 518;

P3. the IP address assigned to the request by a firewall protecting the wireless-Internet gateway;

Q3. the identifier assigned by the wireless-Internet gateway 518 to the session;

R3. the time stamp assigned to the session by gateway 518; and
S3. the telephone number of the wireless-Internet communicator 510, as identified by gateway 518.

Similarly data regarding all sessions handled by a POP 516, which forms part of the system of the present invention, hereafter termed POP/SCMD, is supplied to a POP data module (PPDM) 544. This data typically includes one or more of the following types of information relating to each session:

T3. the IP address assigned to the user for the session;

U3. total time duration of the session, as measured at POP 516;

V3. the time stamp assigned to the session by POP 516; and

W3. the telephone number of the wireless-Internet communicator 510 as identified by POP 516.

The GWDM 542 and PPDM 544 are specific examples of an INDM (intermediary data module) 50 (Fig. 1). The data supplied by the GWDM 542 and the PPDM 544 which, in an end-to-end secure communications environment normally does not contain content data, is here termed session communications data (SCMD).

Whenever a user wishes to access a web site, the user submits via communicator 510 a request to server 512 for a certain web page. The parameters of this request typically include the URL of the requested page and the user Internet address. In addition, in certain cases, a user password is provided with the request.

The CSDM 540 normally receives from server 512 the above request parameters as well as possibly certain user information evoked by receipt of the password. The CSDM analyzes all of this interactive information, including the request parameters, on the basis of predetermined criteria and automatically determines whether the URL requested by the user provides a WI-800 wireless-Internet access subsidy to the user accessing it. This determination is based on a prior commitment made by a content/application provider and recorded in the CSDM and may be dependent, inter alia, upon the category of user, the time and duration of access and, of course, on the specific URL. This commitment preferably may be varied unilaterally, at will and with instantaneous effect by the content/application provider.
The present invention may also provide an icon to the user to indicate to the user when the user is receiving a subsidy on his wireless access costs. A typical icon may be the words "FREE ACCESS" which appear in a dynamic portion of a web page being viewed by the user, as seen, for example at reference numeral 552 in Fig. 9.

Preferably, the icon is provided by the following methodology: The CSDM 540 makes a determination that a session is a subsidized session due to the fact that the URL requested by the user provides a WI-800 wireless-Internet access subsidy to the user accessing it. The CSDM also employs the CSDM/SCMD data for determining whether the wireless-Internet gateway and/or the POP used for communication between the wireless-Internet communicator 510 and the content/application server 512 in a particular session, form part of the system of the present invention and respectively employ a GWDM 542 and/or a PPDM 544. Upon a positive determination, the CSDM sends a subsidized session notification to the content/application server 512.

The content/application server 512 employs the subsidized session notification to activate a dynamic portion of each web page provided by it for download. When a subsidized session notification is present at the content/application server, the dynamic portion of each web page downloaded to the wireless-Internet communicator includes the designated icon.

Session content data (SCND) and session communications data (CSDM/SCND) is supplied from CSDM 540 to a service center (CS) 550, which corresponds to SC 60 (Fig. 1). Session communications data (SCMD) is supplied by GWDM 542 and PPDM 544 to service center 550 in a manner which is described in reference to Fig. 2.

Typically the service center employs session communication data (CSDM/SCMD) forming part of the session data received from CSDM 540 to provide a basis for interrogation of GWDM 542 and to identify the appropriate GWDM 542 to interrogate. As noted above, the CSDM/SCMD data typically includes one or more items of information designated above as A3. – I3. Some or all of this information may be communicated to the GWDM 542 as part of the interrogation request (GWDM/IR) formulated by service center 550, which is communicated to the GWDM 542. Item H3. is typically used by the service center 550 to identify the appropriate GWDM 542 to be
interrogated regarding a given session. The service center 550 typically maintains a look-up table which links the IP addresses of various wireless-Internet gateways 518 with the IP addresses of corresponding GWDMs 542.

When the GWDM 542 receives an interrogation request, it scans through the GWDM/SCMD data received by it from the corresponding wireless-Internet gateway 518 relating to a typically very large number of sessions, most of which are totally unrelated to the sessions with respect to which CSDM/SCMD data is supplied to the service center by CSDM 540.

As the result of the scanning, the GWDM matches GWDM/SCMD data having typically at least items Q3. and R3. which correspond respectively to at least items I3. and F3. in CSDM/SCMD data received from CSDM 540 and adds at least item S3. thereto. In this way, item S3. relating to each of the sessions in which SCND is created and in which the wireless-Internet gateway 518 is involved, is correlated with the SCND data for each such session.

Where appropriate, the service center 550 typically employs session communication data (CSDM/SCMD and/or GWDM/SCMD), forming part of the session data received from CSDM 540 and/or GWDM 542 to provide a basis for formulating an interrogation request (PPDM/IR) which is communicated to the PPDM 544 and for identifying the appropriate PPDM 544 to interrogate. As noted above, the CSDM/SCMD and GWDM/SCMD data typically include one or more items of information designated above as A3. – S3. Some or all of this information may be communicated to the PPDM 544 as part of the interrogation request (PPDM/IR) formulated by service center 550, which is communicated to the PPDM 544. Item B3. is typically used by the service center 550 to identify the appropriate PPDM 544 to be interrogated regarding a given session. The service center 550 typically maintains a look-up table which links all the IP addresses used by a POP 516 for assignment to users to a given POP 516 and links the given POP 516 to the IP address of a corresponding PPDM 544.

When the PPDM 544 receives an interrogation request, it scans through the PPDM/SCMD data received by it from the POP 516 relating to a typically very large
number of sessions, most of which are totally unrelated to the sessions with respect to which CSDM/SCMD data is supplied to the service center by CSDM 540.

As the result of the scanning, the PPDM matches PPDM/SCMD data having typically at least items T3. and V3. which correspond typically to at least items B3. and F3. and adds item W3. thereto. In this way, item W3., relating to each of the sessions in which SCND is created and in which the POP 544 is involved, is correlated with the SCND data for each such session. It is appreciated that item W3., which is identical to item S3., may not be available in certain cases from the GWDM. This is true, for example when the corresponding wireless-Internet gateway 518 operates in an "anonymous mode".

It is appreciated that the multi-stage matching carried out with respect to data at various intermediaries along the communication link between the wireless-Internet communicator 510 and the contact/application server 512 provides a powerful tool to detect and thus eliminate fraud which could be perpetrated by supplying false data at one or more points along the communication link.

In certain cases, no response or an insufficient response is received from one or more of the intermediaries along the communication link. In such cases, interrogation of additional intermediaries becomes important where otherwise it might not have been necessary.

It is also appreciated that not all of the data items A3. – W3., referred to above may be useful or necessary for proper operation of the system and method of the present invention. In a typical situation, aside from the issue of fraud protection, only items W3. or S3. and items B3., L3. or T3. and their association with SCND data corresponding to a given session, may have commercial significance. As noted above, items S3., B3., L3. or T3. provide information regarding the identity of the POP. The identity of the POP typically identifies the wireless ISP and possibly the operator of the wireless network 514.

It is to be appreciated that the CSDM/SCMD data typically include data item I3., which may be configured by the operator of gateway 118 to include the telephone number of the wireless-Internet communicator 510. In this case, aside from the issues of
fraud protection and intermediary participation confirmation, there might not be a need to obtain further information from a GWDM 542 or a PPDM 544 and the SCND and CSDM/SCMD data provided by the CSDM 540 to service center 550 may be sufficient for proper operation thereof.

It is a particular feature of the present invention that the system described hereinabove with reference to Fig. 8 operates automatically and does not require involvement of an operator, except for initial set-up as described hereinafter.

Typically the communications between the service center 550 and the CSDM 540, the GWDM 542 and the PPDM 544 are carried on a session by session basis in real-time or near real-time or on a batch basis from time to time as appropriate.

It is to be appreciated that for the purpose of correlating event timestamps recorded at CSDM 540, GWDM 542 and PPDM 544, the service center 550, as well as CSDM 540, GWDM 542 and PPDM 544 preferably utilize a synchronization mechanism that from time to time provides them with an updated standard time indication such as the coordinated universal time (UTC).

It is also to be appreciated that the process of correlating event timestamps described hereabove, allow for a predetermined tolerance resulting from transmission delays along the communications links between the content/application servers of content application providers and Internet or wireless-Internet communicators.

The present invention, as described hereinabove with respect to Fig. 8 thus enables the following information to be unambiguously associated with the SCND data for each session at the server 512:

I. The telephone number of the wireless-Internet communicator 510;

II. The permanent local wireless network operator to which the wireless-Internet communicator 510 subscribes;

III. The wireless ISP through which the wireless-Internet communicator 510 communicates for a given session; and

IV. The actual wireless network operator through which the wireless-Internet communicator 510 communicates for a given session;
Item I is known from either items W3. or S3. above.

Item II is known from the prefix of item I.

Item III is known from any of items B3., L3. or T3. above.

Item IV is known either from any of items B3., L3. or T3. above, possibly also employing information received from the ISP.

Reference is now made to Fig. 10A, which illustrates the functionality of a CSDM, such as CSDM 140 in the embodiment of Fig. 9, in a WI-800 environment.

Upon commencement of a session between a new user and a content/application server such as server 512, (Fig. 9), the CSDM, such as CSDM 540 (Fig. 9) receives from the server an ID of a URL which is requested by the user and possibly also categorization information regarding the user, as well as the CSDM/SCMD data. Such categorization information may be derived by the server from a user password.

The CSDM determines whether the URL requested by the user provides a WI-800 wireless-Internet access subsidy to the user accessing it. This determination is based on a prior commitment made by a content/application provider and recorded in the CSDM and may be dependent, inter alia, upon the category of user, the time and duration of access and, of course, on the specific URL. This commitment preferably may be varied unilaterally, at will and with instantaneous effect by the content/application provider.

If a WI-800 wireless-Internet access subsidy is provided by the URL requested by the user, the CSDM saves both the URL ID and the relevant CSDM/SCMD data. In addition, the CSDM sends a subsidized session notification to the content/application server 512 (Fig. 9), which in turn, activates the icon 552 (Fig. 9).

If another URL is requested by the same user the above procedure is repeated.

If, within a predetermined period, another URL having WI-800 wireless-Internet access subsidy entitlement has not been requested, the CSDM prepares a "subsidized session series report" for a service center, such as service center 550 (Fig. 9), containing all of the URL IDs and corresponding CSDM/SCMD data for the "session series"
containing one or more sequential URL requests of the user. These reports are sent to the service center periodically.

It is appreciated that in a circuit switched data (CSD) wireless-Internet environment, the WI-800 wireless-Internet access subsidy may cover an interval up to a predetermined time duration which typically is the time that elapses between sequential URL requests in typical surfing on a given site. In practice, where there are a series of sequential requests for "subsidized URLs", the time intervals therebetween up to the predetermined time duration, as well as an additional predetermined “time-out” interval which covers user interaction with the last subsidized URL are subsidized as part of a subsidized session series.

Reference is now made to Fig. 10B, which illustrates the functionality of a GWDM, such as GWDM 542 in the embodiment of Fig. 9, in a WI-800 environment.

When the GWDM receives a GWDM/IR regarding a subsidized session series involving at least one subsidized URL, it scans its database in order to correlate the GWDM/SCMD data for the one or more subsidized sessions in the subsidized session series referenced in the GWDM/IR. The correlated data is reported to the service center. In the event of non-correlation, this fact is also reported to the service center, since it may be indicative of fraudulent activity.

Reference is now made to Fig. 10C, which illustrates the functionality of a PPDM, such as PPDM 544 in the embodiment of Fig. 9, in a WI-800 environment.

When the PPDM receives a PPDM/IR regarding a subsidized session series involving at least one subsidized URL, it scans its database in order to correlate the PPDM/SCMD data for the one or more subsidized sessions in the subsidized session series referenced in the PPDM/IR. The correlated data is reported to the service center. In the event of non-correlation, this fact is also reported to the service center, since it may be indicative of fraudulent activity.

Reference is now made to Fig. 10D to 10F, which illustrate the functionality of a service center, such as service center 550 in the embodiment of Fig. 9, in a WI-800 environment.
When the service center receives the subsidized session series report from the CSDM, it generates the GWDM/IR for the subsidized session series and sends it to the appropriate GWDM. Upon receiving the correlated data from the GWDM to which the GWDM/IR was directed, the service center determines whether the user's telephone number and the POP ID are both included in the correlated data. If so, the correlated data is stored in a database such as database 406 in the embodiment of Fig. 8.

If, however, correlated data from the GWDM is not available or either the user's telephone number or the POP ID are not included in the correlated data from the GWDM, a PPDM/IR interrogation request is necessary. The service center transmits the PPDM/IR to the appropriate PPDM and upon receipt of the correlated data therefrom, extracts the user's telephone number and/or the POP ID therefrom, as appropriate. The correlated data is stored in a database such as database 406 in the embodiment of Fig. 8.

Failure to obtain the user's telephone number and the POP ID from correlated data results in a failure to effect a subsidy of the user's access charges for a session.

Periodically, the correlated data stored in the service center database as well as the applicable access costs for the relevant sessions are retrieved by an SDR generator, such as generator 404 in the embodiment of Fig. 8. The SDR generator prepares subsidized session series SDRs (SSS SDRs) and stores them in the service center database, such as database 406 (Fig. 8).

Periodically, the SSS SDRs are retrieved from the database by a billing/clearing subsystem, such as subsystem 408 (Fig. 8). The billing/clearing subsystem prepares for each content/application provider a combined debit report for all relevant SSS SDRs received by the service center within a certain period and based, inter alia, on access costs of relevant wireless network operators. Similarly, the billing/clearing subsystem prepares for each wireless network operator a combined credit report including all relevant SSS SDRs received by the service center within a certain period. These reports are periodically sent to the appropriate content/application providers and wireless network operators.

Typically the credit reports are formatted so as to be compatible with conventional telephone billing systems, such as conventional customer care and billing
systems (CCBS). One appropriate format, particularly useful in GSM environments, is TAP (Transfer Account Procedure).

It is a particular feature of the present invention that credits may be provided for wireless systems using either or both time and packet count billing. When credits are provided to wireless systems using packet count billing, the SCND data from the CSDM preferably includes bit counts for user requests and downloads to users in subsidized sessions. These bit counts are subsequently taken into account in the SDR generator of the service center typically by applying the appropriate compression ratio of the wireless-Internet gateway involved in a given subsidized session series.

It is to be appreciated that the description with reference to Figs. 9 and 10A – 10F hereinabove, may also apply, with the applicable modifications, to an Internet environment which is not necessarily a wireless-Internet environment.

Reference is now made to Fig. 11, which is a simplified block diagram illustrating the operation of a clearance center in a subsidized access wireless-Internet environment. Fig. 11 illustrates how a clearance center, here designated by reference numeral 600, transfers session series subsidizes from a multiplicity of content/application providers, here designated by reference numeral 602 to plurality of wireless network operators, here designated by reference numeral 604, each for crediting the accounts of a multiplicity of users, here designated by reference numeral 606.

It is appreciated that the provision of a clearance center 600 obviates the need for each wireless network operator to bill each relevant content/application provider.

It is also appreciated that the clearance center 600 may typically handle other functionalities of the present invention such as revenue sharing between entities in the value chain between the user and the content/application server, billing to a user for transactions between a user and a content/application provider which is effected by an entity in the value chain, content-based billing for Internet access and composite content-based billing for Internet access.

Reference is now made to Fig. 12A, which is a simplified block diagram illustration of another preferred embodiment of the invention, configured for operation in a subsidized access wireless-Internet environment. As seen in Fig. 12A, a wireless-
Internet communicator 710, such as a WAP enabled telephone, communicates at least partially along the Internet via plural intermediaries, with a content/application provider facility 712, preferably comprising at least one content/application server with web pages stored thereat. In the illustrated embodiment of Fig. 12A, the wireless-Internet communicator 710 communicates via a wireless network 714, which is typically a circuit switched data (CSD) network or a packet data (PD) network, with an Internet Point of Presence (POP) 716 which, in turn, communicates with a wireless-Internet gateway 718, such as a WAP gateway. The wireless-Internet gateway 718 communicates typically via a firewall 720 and a router 722 via the Internet and optionally or alternatively via a LAN or a WAN with a desired content/application provider facility 712, which may include a wireless-enabled server such as a WAP-enabled server, or a non-wireless-enabled server.

It is to be appreciated that there exist a plurality of POPs 716, a plurality of wireless-Internet gateways 718, a plurality of firewalls 720 and a plurality of routers 722, each of which may or may not form part of the system of the present invention. Similarly, there exist a multiplicity of content/application provider facilities 712, each of which may or may not form part of the system of the present invention. For the sake of conciseness and clarity, the description of the present invention relates to a situation where a wireless-Internet communicator 710 communicates with a content/application provider facility 712 via at least one of a POP 716, a wireless-Internet gateway 718, a firewall 720 and a router 722, all of which form part of the system of the present invention.

In accordance with this preferred embodiment of the present invention illustrated in Fig. 12A, as contrasted with the embodiment described hereinabove with respect to Figs. 9 - 11, session data, including but not normally limited to session content data (SCND) relating to the content of a communications session between a user, employing communicator 710, and a content/application provider, employing facility 712, is not necessarily communicated from a content server data module (CSDM).

In accordance with a preferred embodiment of the present invention session communication data (SCMD) regarding all sessions handled by a POP 716, a wireless-
Internet gateway 718, a firewall 720 and a router 722, which form part of the system of the present invention is supplied to a wireless network operator/wireless ISP processing module (WOIPM) 724. The WOIPM 724 is a specific example of an INDM (intermediary data module) 50 (Fig. 1). This data typically includes one or more of the following types of information relating to each session:

GW/SCMD data received from Gateway 718, which typically includes:

a. the source IP address associated with the session as identified by gateway 718;
b. the URL associated with the session;
c. the destination IP address associated with the session as identified by gateway 718;
d. an optional dynamic parameter appearing as a suffix to the session request;
e. the total number of bytes sent to content/application provider facility 712 from the wireless-Internet communicator 710 as a session request, as identified at gateway 718;
f. the total number of bytes sent from content/application provider facility 712 to the wireless-Internet communicator 710 in response to the session request, as identified at gateway 718; and
g. the time stamp assigned to the session by gateway 718.

PP/SCMD data received from POP 716, which typically includes:

h. the IP address assigned by POP 716 to the user for the session;
i. the total time duration of the session, as measured at POP 716;
j. the time stamp assigned to the session by POP 716; and
k. the telephone number of the wireless-Internet communicator 710 as identified by POP 716.

RT/SCMD data received from router 722, which typically includes:

l. the source IP address associated with the session as identified by router 722;
m. the destination IP address associated with the session as identified by router 722;

n. the total number of bytes sent to content/application provider facility 712 from the wireless-Internet communicator 710 as a session request, as identified at router 722;

o. the total number of bytes sent from content/application provider facility 712 to the wireless-Internet communicator 710 in response to the session request, as identified at router 722; and

p. the time stamp assigned to the session by router 722.

FW/SCMD data received from firewall 720, which typically includes:

q. the local IP address assigned to the session by firewall 720;

r. the global IP address assigned to the session by firewall 720; and

s. the time stamp assigned to the session by firewall 720.

Whenever a user wishes to access a web site, the user submits via communicator 710 a request to server 712 for a certain web page. The parameters of this request typically include the URL of the requested page and the user Internet address. In addition, in certain cases, a user password is provided with the request.

In a non-end-to-end secure communication environment, the GW/SCMD data includes the URLs requested by the user and the PP/SCMD data includes the user's telephone number.

The WOIPM 724 matches the URLs with a list, typically maintained thereat, which contains URLs of all web pages for which a WI-800 wireless-Internet access subsidy is being made available. URLs for which a subsidy is provided are then matched with the user's telephone number by the WOIPM 724 to provide subsidy credit to the account of that telephone number.

In accordance with an alternative embodiment of the invention, a WI-800 wireless-Internet access subsidy is not available to all visitors to a web site. Rather it may be made available only to certain users. Typically, this alternative embodiment
requires a suitable type of construction of web pages at the content/application server of content/application provider facility 712, and subsidized user identification functionality at WOIPM 724. This alternative embodiment is described hereinbelow with reference to Fig. 27, which illustrates a typical multiple web page structure at content/application provider facility 712 and with reference to Fig. 28, which illustrates functionality of WOIPM 724 employing that multiple web page structure.

In accordance with a further alternative embodiment of the invention a WI-800 wireless-Internet access subsidy is made available only for users who complete transactions at the subsidizing web site. Typically, this embodiment requires a suitable type of construction of web pages at the content/application server of content/application provider facility 712 and transaction-based subsidized use identification functionality at WOIPM 724. This embodiment is described hereinbelow with reference to Fig. 29, which illustrates a typical multiple web page structure at content/application provider facility 712 and with reference to Fig. 29, which illustrates functionality of WOIPM 724 employing that multiple web page structure.

In a non-end-to-end secure communication environment, the GW/SCMD data and the PP/SCMD data is sufficient to enable the WOIPM 724 to identify and report appropriate subsidies relating to given URLs to credit appropriate user's telephone number accounts.

In an end-to-end secure communication environment, this is not the case, since the URLs are not normally obtainable as part of the GW/SCMD data. In such a case the FW/SCMD data from firewall 720 and the RT/SCMD data from router 722 are required in order to provide IP address information corresponding to the web-sites requested by a user.

In such a case, the WOIPM 724 matches the IP addresses associated with the content/application provider facility 712 requested by the user with a list, typically maintained thereat, which contains IP addresses of all web sites for which a WI-800 wireless-Internet access subsidy is being made available. IP addresses identified as providing a subsidy are then matched with the user's telephone number by the WOIPM 724 to enable providing subsidy credit to that telephone number account.
The functionality of matching the user's telephone number by the WOIPM 724 is now described in detail with reference to Fig. 12A.

In a non-end-to-end secure communication environment, when a user requests a given URL, the WOIPM 724 matches GW/SCMD data having typically at least items a. and g. with PP/SCMD data having typically at least items h. and j. In this way, items b., e. and g. are correlated with item k.

In a non-end-to-end secure communication environment, when a response is sent responsive to a user request for a given URL, the WOIPM 724 matches GW/SCMD data having typically at least items c. and g. with PP/SCMD data having typically at least items h. and j. In this way, items b., f. and g. are correlated with item k.

In an end-to-end secure communication environment, when a user requests a given URL, the WOIPM 724 initially matches RT/SCMD data having typically at least items l. and p. with FW/SCMD data having typically at least items r. and s. Thereafter, for the same session, the WOIPM 724 matches FW/SCMD data having typically at least items q. and s. with PP/SCMD data having typically at least items h. and j. In this way, items m., n. and p. are correlated with item k.

In an end-to-end secure communication environment, when a response is sent responsive to a user request, the WOIPM 724 initially matches RT/SCMD data having typically at least items m. and p. with FW/SCMD data having typically at least items r. and s. Thereafter, for the same session, the WOIPM 724 matches FW/SCMD data having typically at least items q. and s. with PP/SCMD data having typically at least items h. and j. In this way, items l., o. and p. are correlated with item k.

It is appreciated that the multi-stage matching carried out with respect to data from various intermediaries along the communication link between the wireless-Internet communicator 710 and the content/application provider facility 712 provides a powerful tool for associating a user's telephone number with user visits to sites that provide WI-800 subsidized wireless-Internet access.

WOIPM 724 prepares subsidized session series SDRs (SSS SDRs) using a methodology based on the time intervals between SDRs, as described for CSDM 140 (Fig. 9) with reference to Figs. 10A and 10F. SSS SDRs prepared by WOIPM 724
typically include the total duration and/or total number of packets associated with each SSS SDR.

The correlated data and SSS SDRs referred to hereinabove provides all the necessary information for crediting a subscriber's telephone number account in respect of subsidized wireless-Internet access charges except for rating information, i.e. the amount of the subsidy per unit time or per packet of data or per a combination thereof.

The amount of the subsidy may be a flat rate per unit of time or per packet of data or per a combination thereof, independent of the actual specific rate assigned by the wireless network operator/wireless ISP to a given subscriber in respect of wireless-Internet access charges relating to a given session or it may be related to the actual specific rates assigned by the wireless network operator/wireless ISP to a given subscriber in respect of wireless-Internet access charges relating to each given session.

In a case where the amount of the subsidy is independent of the actual specific rate charged to a given subscriber in respect of wireless-Internet access charges relating to a given session, the applicable rate per unit time, or per packet of data or per a combination thereof is retrieved from a database of the WOIPM 724. It is understood that one or more such "flat" rates per unit time, or per packet of data or per a combination thereof may be stored at WOIPM 724, corresponding, inter alia, to different wireless network operators, different wireless ISPs and different times of day.

In a case where the amount of the subsidy is dependent of the actual specific rate paid by a given subscriber in respect of wireless-Internet access charges relating to a given SSS SDR, the applicable subsidy rate per unit time, or per packet of data or per a combination thereof is retrieved from an external database in the Customer Care and Billing System (CCBS) 730 of the wireless network operator/wireless ISP with which WOIPM 724 is associated. In such a case, the subsidy for a given SSS SDR may exactly match the cost paid by the user.

It is a particular feature of the embodiment described with reference to Fig. 12A that credits may be provided for wireless systems using either or both time and packet count billing. When credits are provided to wireless systems using packet count billing, data from the GW/SCMD and RT/SCMD preferably includes bit counts for user
requests and downloads to users in subsidized sessions. These bit counts are subsequently taken into account by WOIPM 724 typically by applying the appropriate compression ratio of the wireless-Internet gateway involved in a given subsidized session series.

It is understood that the subsidy may be partial, such that the amount of subsidy is less than the actual amount charged to a given subscriber in respect of wireless-Internet access charges relating to given sessions.

Subsidies to be credited to subscribers are periodically reported by WOIPM 724 to CCBS 730. Alternatively, WOIPM 724 may provide CCBS 730 with un-rated WI-800 SSS SDR information, including, inter alia, total duration, total number of packets, time stamp and subscriber’s telephone number for each such SSS SDR but not including the rate per unit time, per packet of data or per a combination thereof or any amount calculated according to such rate. CCBS 730 uses this information for calculating the credit due to subscribers, based on subsidy rates stored at the CCBS 730 and for crediting the subscribers accordingly.

SSS SDRs are preferably provided by WOIPM 724 to CCBS 730 in a standard format suitable for CCBS 730, such as Transfer Account Procedure (TAP) Call Data Records (CDRs), widely used in the GSM world.

It is to be appreciated that in a case where the subsidy is partial, i.e., the amount of subsidy is less than the actual amount charged to a given subscriber in respect of wireless-Internet access charges relating to given sessions, the partial level of subsidy is retrieved from a database of WOIPM 724 and is used for calculating the credit due to the subscriber. Such partial subsidy level may be represented in the form of a subsidy rate which is lower than the rate normally charged to that subscriber, in the form of a limit to the duration subsidized in respect of given sessions or in the form of a limit to the number of packets of data subsidized in respect of given sessions.

It is to be appreciated that CCBS 730 may include a post-paid billing system in which subscribers are billed on a periodic basis, or a pre-paid billing system, in which subscribers are charged on a real-time basis. In case CCBS 730 includes a pre-paid billing system, WOIPM 724 is preferably configured to operate in a near real-time manner, where session information is processed and supplied to CCBS 730 by WOIPM.
724 within a relatively short time after a session is terminated, so that the appropriate credit may be applied to the subscriber's account quickly. The near real-time functionality of WOIPM 724 is important in situations where subscriber's pre-paid account balance is low and his wireless-Internet communicator 710 might be disconnected by a command of CCBS 730 if the credit is not applied in time.

It is appreciated that where a subscriber is charged a fixed price for unlimited wireless-Internet access by the wireless operator/ISP, such as for example a fixed price per month regardless of the actual usage of wireless-Internet within the month, the embodiment of Fig. 12A enables limiting the amount of WI-800 credit provided to the subscriber, such that the total amount of subsidy over a period of time will not exceed the fixed price charged to him.

In accordance with a preferred embodiment of the invention, most but not all of the correlated data referred to hereinabove, as well as the actual amount of the subsidy for each subsidized session, associated with such correlated data, is supplied to a service center 740. Preferably, the actual telephone number of the user is not supplied, in order to protect user confidentiality and as not being necessary.

The service center 740 collates the information received from the WOIPM 724 according to content/application provider facilities and bills each such content provider accordingly in respect of such services. The service center 740 from time to time also updates the lists stored in the WOIPM 724 with new sites providing WI-800 wireless-Internet access subsidy and with the corresponding URLs and IP addresses.

It is appreciated that the embodiment of Fig. 12A, as described hereinabove, as contrasted from the embodiment of Figs. 9 - 11, does not require any functionality to be resident at the content/application server of the content/application provider facility (712) which provides a subsidy. Optionally, however, certain functionality may be provided at the content/application provider facility 712, as will be described hereinbelow:

An icon generator 742 is preferably provided in association with content/application provider facility 712 for indicating to the user when the user is receiving a subsidy on his wireless-Internet access costs. Each icon generator 742
preferably monitors user requests to the corresponding content/application provider facility 712 and identifies the source IP address and the referrer URL in respect of each such request. The icon generator 742 is typically embodied in a software module resident in the content/application provider facility 712.

Icon generator 742 typically maintains a list which associates each wireless network operator/wireless ISP providing wireless-Internet access subsidy with all IP addresses assigned by such wireless network operator/wireless ISP to users requests. Upon a user request, icon generator 742 typically determines whether the source IP address in respect of the request corresponds to a wireless network operator/wireless-Internet service provider who is a participant in the subsidy program and thus has associated therewith a WOIPM 724. If confirmed, icon generator 742 preferably activates presentation of a suitable subsidized access icon or other indication to the user, such as for example, a FREE ACCESS icon shown on the screen of wireless-Internet communicator 710 (Fig. 12A), which is preferably overlaid on the user's view of the relevant web page. This icon typically informs the user that his wireless-Internet access charges are being subsidized. The subsidized access icon is preferably located on web pages of content/application provider facility 712 in one or both of the following formats:

I. On web pages for which a WI-800 wireless-Internet access subsidy is being offered; and

II. Next to an HTTP link in content/application provider facility 820 referring to web pages for which a WI-800 wireless-Internet access subsidy is being offered.

Icon generator 742 also typically maintains a list which associates portals offering WI-800 functionality to their content/application providers with all URLs of such portals containing links to such content/application providers' web sites. Upon a user request, icon generator 742 typically determines whether the referrer URL in respect of the request corresponds to a portal who is offering WI-800 functionality. If confirmed, icon generator 742 preferably displays a WI-800 icon which includes an identification of the portal offering the WI-800 functionality.
Icon generator 742 typically receives updates as to participating wireless network operators/wireless ISPs as well as participating portals via the service center 740.

A fraud monitor 744 is preferably provided in association with content/application provider facility 712. Each fraud monitor 744 preferably monitors user requests to the corresponding content/application provider facility 712 and notes session communications data (FM/SCMD) in respect of each such request, provided to it by the content/application provider facility 712. The fraud monitor 744 may be embodied in a software module resident in the content/application provider facility 712 or in a standalone software module resident in a separate server.

Fraud in the context of this invention relates to a scenario wherein the GW/SCMD data retrieved by wireless-Internet gateway 718 includes a request for a given URL and the URL eventually downloaded to wireless-Internet communicator 710 in response to such request is a different URL. It is appreciated that there may exist various techniques for forging the URL identified by wireless-Internet gateway 718, resulting, inter alia in providing improper wireless-Internet access subsidies to the user of wireless-Internet communicator 710.

When there exists a suspicion of fraud according to predetermined criteria established at the service center 740, the service center 740 sends an interrogation request (FM/IR) to the fraud monitor 744 for FM/SCMD data relating to subsidies paid to hackers who did not in fact visit the sites in respect of which the subsidies were granted. Such a fraud may be detected by sensing at service center 740 unusually large subsidies payable to given users and then checking with fraud monitor 744 whether those users actually visited the subsidized sites at the corresponding times.

Typically the communications between WOIPM 724 and POP 716, Gateway 718, firewall 720, and router 722, as well as the communications between fraud monitor 744 and content/application provider facility 712 are effected either via a LAN or by a direct point-to-point connection.

Typically the communications between the service center 740 and WOIPM 724, icon generator 742 and fraud monitor 744 are carried by the Internet, by a private IP
network, by a virtual private IP network (VPN) or by any other suitable communications channel having appropriate security against fraud and in a manner which minimizes opportunity for repudiation of transactions.

Typically the communications between the service center 740 and the WOIPM 724 are carried on a session by session basis in real-time or near real-time or on a batch basis from time to time as appropriate.

Firewall 720 is an example of a Network Address Translator (NAT) device, which typically converts IP addresses of communications sessions. There may exist other or additional intermediaries along the communication link between the wireless-Internet communicator 710 and the content/application provider facility 712 which have similar NAT functionality, some of which are not shown in Fig. 12A. It is to be appreciated that if there exists an additional intermediary with NAT functionality, the multi-stage matching carried out with respect to data from various intermediaries along the communication link between the wireless-Internet communicator 710 and the content/application provider facility 712 is extended to include such additional intermediary.

It is also to be appreciated that for the purpose of correlating event timestamps provided to WOIPM 724 by POP 716, gateway 718, firewall 720 and router 722, as well as for the purpose of correlating event timestamps provided to service center 740 by WOIPM 724 and fraud monitor 744, the service center 740, WOIPM 724 and fraud monitor 744 utilize a synchronization mechanism that from time to time provides them with an updated standard time such as the coordinated universal time (UTC).

It is also to be appreciated that the process of correlating event timestamps described hereabove, allow for a predetermined tolerance resulting from transmission delays along the communications link between the content/application provider facility 712 and the wireless-Internet communicator 710.

It is a particular feature of the present invention that the system described hereinafter with reference to Fig. 12A normally operates automatically and does not require involvement of an operator, except for initial set-up as described hereinafter.
Reference is now made to Fig. 12B, which is a simplified block diagram illustration of another preferred embodiment of the invention configured for operation in a subsidized access wireless-Internet environment. The embodiment of Fig. 12B may be identical to that of Fig. 12A in all relevant respects other than in that one or more of a content/application provider facility 820, a CPGW collector 822, an icon generator 824, a phantom object generator 826 and a wireless-Internet communicator 828 are additionally provided in the embodiment of Fig. 12B.

Content/application provider facility 820 preferably has at least the same functionality as content/application provider facility 712 in the embodiment of Fig. 12A.

Wireless-Internet communicator 828 preferably has at least the same functionality of wireless-Internet communicator 710 in the embodiment of Fig. 12A. Wireless-Internet communicator 828 preferably includes a cache memory 830. All other elements in Fig. 12B are designated by the same reference numerals used in Fig. 12A.

CPGW collector 822 preferably is operative for collecting session communications data (CPGW/SCMD) from content/application provider facility 820 in an end-to-end secured wireless-Internet communications environment. Typically in such environment, wireless-Internet gateway 718 is incapable of providing the necessary session communication data (GW/SCND) for providing WI-800 wireless-Internet access subsidy. Such data, which typically contains URL information, may be retrieved from content/application provider facility 820 by CPGW collector 822.

The CPGW/SCMD data preferably is supplied by CPGW collector 822 to service center 740, which sorts it by operator/ISP of wireless network 714. The sorted CPGW/SCMD data is supplied by service center 740 to corresponding WOIPMs 724. WOIPMs 724 correlate the CPGW/SCMD data with PP/SCMD, FW/SCMD and RT/SCMD data for obtaining all the necessary information for crediting subscribers’ telephone numbers in respect of subsidized wireless-Internet access charges in the end-to-end secure wireless-Internet communications environment.

Icon generator 824 preferably is operative for indicating to the user when the user is receiving a subsidy on his wireless-Internet access costs. Preferably icon
generator 824 is embodied in a conventional web server connected to the Internet as well as to service center 740.

In general terms, the operation of the icon generator 824 in cooperation with various content/application provider facilities 820 may be understood as follows: a content/application provider wishing to subsidize wireless-Internet access to its content/application provider facility 820 normally enters into an agreement with one or more operators/ISPs employing wireless networks 714. Such a content/application provider also establishes an HTTP link, hereinafter termed icon-generating link, on each web page of its content/application provider facility 820 where an icon is to be displayed. The icon-generating link preferably includes, inter alia, an identification of the content/application provider facility 820.

When a potential icon-bearing page is downloaded via the Internet to a wireless-Internet communicator 710 or 828, the icon-generating link is downloaded automatically along with the page. A browser operated by the wireless-Internet communicator 710 or 828 automatically activates the link, which generates an HTTP request, which is directed over the Internet to icon generator 824. Upon receiving the HTTP request, the icon generator ascertains both the identity of the content/application provider facility 820 and the identity of the operator/ISP of wireless network 714 and checks a look-up table to determine whether the given facility 820 and the operator/ISP of wireless network 714 have an agreement for subsidizing wireless-Internet access.

If the look-up table indicates that indeed a given facility 820 has a subsidy agreement with a given operator/ISP of wireless network 714, the icon generator 824 downloads a subsidized access icon as response to the HTTP request. If the look-up table indicates that a given facility 820 does not have such an agreement with the given operator, a blank icon is downloaded as a response to the HTTP request, with the result that the user does not see any icon indicating subsidization. Icon generator 824 receives from time to time updates from service center 740 in respect of parameters identifying content/application provider facilities 820 and wireless network operators/wireless ISPs employing wireless networks 714 as well as updates to the look-up table.
It is to be appreciated that an icon-generating link and the resulting subsidized access icon may have the following locations at content/application provider facility 820:

I. On a web page for which WI-800 wireless-Internet access subsidy is being offered; and

II. Next to an HTTP link referring to web pages for which WI-800 wireless-Internet access subsidy is being offered.

Phantom object generator (POG) 826 preferably is operative to ensure that a proper subsidy is paid in respect of a web page downloaded from cache memory 830 of wireless-Internet communicator 828. Preferably POG 826 is embodied in a conventional web server connected to the Internet and to service center 740. When a web page is downloaded from cache memory 830 for display, a suitably configured automatically actuated link in the web page requests a phantom object from POG 826. The request of this phantom object is utilized to enable a user to receive a subsidy on his wireless-Internet access costs in respect of the web page stored in the cache memory 830. The phantom object is needed for this purpose since otherwise, display of a web page downloaded from a cache memory 830 would not be noted by any element of the system of Fig. 12B other than the wireless-Internet communicator 828.

POG 826 also receives, from time to time, updates from service center 740 in respect of parameters identifying content/application provider facilities 820.

Another technique for ensuring that a proper subsidy is paid in respect of display of a given web page is to embed in such web page HTTP parameters which prevent such page from being downloaded from the cache memory for display purposes. Such HTTP parameters for example, are: AddHeader "Pragma"; "no-cache"; CacheControl = "no-cache, must-revalidate"; CacheControl = "max-age=0"; CacheControl = "private"; and Expires = -1.

POG 826 preferably is also operative to monitor and prevent fraud, in addition or as an alternative to fraud monitor 744. As phantom object downloads can only be activated by WI-800 web page downloads, GW/SCMD and CPGW/SCMD data
associated with phantom object downloads may be used to determine whether a user actually visited the web pages which initiated the phantom object downloads.

The communications between the service center 740 (Fig. 12B) and CPGW collector 822 (Fig. 12B), icon generator 824 (Fig. 12B) or POG 826 (Fig 12B) may be carried by the Internet, by a private IP network, by a virtual private IP network (VPN) or by any other suitable communications channel having appropriate security against fraud and in a manner which minimizes opportunity for repudiation of transactions.

It is a particular feature of the present invention that the system described hereinabove with reference to Fig. 12B normally operates automatically and does not require involvement of an operator, except for initial set-up as described hereinafter.

It is to be appreciated that for the purpose of correlating event timestamps provided to WOIPM 724 by CPGW collector 822 and used by WOIPM 724 for calculating subsidy credits in an end-to-end secure wireless-Internet communications environment, as well as for the purpose of correlating event timestamps provided to service center 740 by WOIPM 724 and CPGW collector 822 and used by service center 740, WOIPM 724 and CPGW collector 822 preferably utilize a synchronization mechanism that from time to time provides with an updated standard time indication, such as coordinated universal time (UTC).

It is also to be appreciated that the process of correlating event timestamps described hereabove, allow for a predetermined tolerance resulting from transmission delays along the communications link between the content/application provider facility 712 or 820 and the wireless-Internet communicator 710 or 828.

It is noted that the system and methodology described hereinabove with reference to Fig. 12B is applicable to a content-based billing environment wherein users are charged for content downloaded by them over a wireless-Internet network rather for wireless-Internet access. Therefore, the charge made to the user is per content and not per access time or packets. In such an environment, it is often desirable that wireless-Internet access charges to the user be neutralized.

In content-based billing environments, the user may receive credits for subsidies in the manner described hereinabove with reference to Fig. 12B, but the corresponding
cost of such credits is not charged to the subsidized web sites visited by the user. Rather, the cost of such credits is absorbed by the wireless operator/ISP and is presumably covered by the per-content charge made to the user. In this way the wireless-Internet access charges to the user are neutralized in respect of sites employing content-based billing.

Reference is now made to Fig. 13, which illustrates a preferred embodiment of the WOIPM 724 (Figs. 12A and 12B) useful in an environment such as that of Fig. 12A or Fig. 12B, including one or more of POP 716, wireless-Internet gateway 718, firewall 720 and router 722 as well as CCBS 730 and service center 740. The WOIPM 724 preferably includes a POP data collector (PPDC) 750, a gateway data collector (GWDC) 752, a firewall data collector (FWDC) 754 and a router data collector (RTDC) 756.

POP data collector (PPDC) 750 receives the PP/SCMD output from POP 716. The gateway data collector (GWDC) 752 receives the GW/SCMD output from gateway 718. The firewall data collector (FWDC) 754 receives the FW/SCMD output from firewall 720. The router data collector (RTDC) 756 receives the RT/SCMD output from router 722.

A data gatherer and sorter 760 receives outputs from POP data collector (PPDC) 750, gateway data collector (GWDC) 752, firewall data collector (FWDC) 754 and router data collector (RTDC) 756 and cooperates with a database 762 to determine which portions of those outputs are retained. Generally speaking, only information relating to web sites, which provide subsidized wireless-Internet access, is relevant. A list of such web sites, including preferably both their relevant URLs and IP addresses, is entered by service center 740 via manager 768 to database 762, stored thereat and accessed by the data gatherer and sorter 760.

If, for a given session, URL information is received in the GW/SCMD data from GWDC 752, the session is considered to be a non-end-to-end secure wireless-Internet session and the RT/SCMD data received from RTDC 756 as well as the FW/SCMD data received from FWDC 754 are not relevant, inasmuch as the URL information is sufficient to enable a determination to be made as to whether the session is subsidized.
If, however for a given session, URL information is not received in the GW/SCMD data from GWDC 752, the session is considered to be an end-to-end secure wireless-Internet session and the RT/SCMD data received from RTDC 756 as well as the FW/SCMD data received from FWDC 754 are both normally relevant, inasmuch as the IP address information is required to enable a determination to be made as to whether the session is subsidized. It is noted in this context that both the RT/SCMD data received from RTDC 756 as well as the FW/SCMD data received from FWDC 754 are normally required due to the fact that the source IP address assigned to a user’s request often changes between the POP 716 and the router 722.

Once a determination has been made as to whether a session is subsidized, the telephone number of the wireless-Internet communicator 710 (Figs. 12A and 12B) to which the subsidy is to be credited must be determined. This is normally done by a transaction analyzer 764, in cooperation with the database 762, utilizing the PP/SCMD data received from PPDC 750 via data gatherer and sorter 760. Transaction analyzer 764 then prepares subsidized session series SDRs (SSS SDRs) preferably employing a methodology, described hereinabove with reference to Figs. 10A and 10F, based on the time intervals between SDRs.

Transaction analyzer 764 may also perform a rating function, i.e. attaching a monetary value to the subsidy to be credited to the user’s telephone number account. This rating function employs information received from CCBS 730. Periodically, as instructed by manager 768, the transaction analyzer reports to the CCBS 730 regarding the subsidies to be credited to its subscribers. Alternatively, transaction analyzer 764 may provide CCBS 730 with un-rated WI-800 SSS SDR information, including, inter alia, information relating to a total duration of sessions, a total number of packets, a time stamp and a subscriber’s telephone number but not including the rate per unit time, per packet of data or per a combination thereof or any amount calculated according to such rate. This information is preferably provided in a standard format, such as Transfer Account Procedure (TAP) Call Data Records (CDRs), widely used in the GSM world.

CCBS 730 uses such SSS SDR information for calculating credits due to subscribers and for affecting the credits. CCBS 730 (Fig. 12A and 12B) preferably
includes a negative rating functionality, by which session information received from WOIPM 724 is rated by applying the regular rates assigned by the operator/ISP employing wireless network 714 to a given subscriber in respect of wireless-Internet access charges, and by automatically assigning a negative value to such rates.

It is to be appreciated that CCBS 730 may include a post-paid billing system in which subscribers are billed on a periodic basis, or a pre-paid billing system, in which subscribers are charged on a real-time basis. Where CCBS 730 includes a pre-paid billing system, WOIPM 724 is preferably configured to operate in a near real-time manner, where session information is processed and supplied to CCBS 730 by WOIPM 724 within a relatively short time after the session is terminated, so that the appropriate credit may be applied to the subscriber’s account quickly. The near real-time functionality of WOIPM 724 is important in situations where subscriber’s pre-paid account balance is low and his wireless-Internet communicator 710 may be disconnected by a command of CCBS 730 if credit is not applied in time.

SSS SDR information generated by transaction analyzer 764 is also supplied by it via a messaging and security subsystem 766 to the service center 740 for billing in respect of the subsidy credits to each content/application provider participating in the subsidy program. In content-based billing environments, where the cost of the subsidy is neutralized, and thus not charged to content/application providers, transmission of the SSS SDR information to the service center 740 is obviated.

The transaction analyzer 764 preferably removes from its reports to the service center 740 identification of the telephone numbers of the users in respect of which subsidies are provided for user privacy protection purposes.

Transaction analyzer may also calculate the credits due to a subscriber where the subscriber is charged a fixed price for unlimited wireless-Internet access by the wireless operator/ISP, such as for example a fixed price per month regardless of the actual usage of wireless-Internet within the month.

Preferably, the amount of credit received by the subscriber is proportional to the ratio between subsidized wireless-Internet access and total wireless-Internet access of the user over a given time. Thus, for example, if the total wireless-Internet access over a
given month was 10 hours, the subsidized wireless-Internet access was 2 hours and the monthly fixed charge to the user for wireless access was $15.00, the user receives a credit of one-fifth of his monthly fixed charge for wireless-Internet access, i.e. $3.00.

Allocation of the cost of the subsidy credited to the user as between the various subsidized sites visited by the user is preferably proportional to the time spent by the user on each site.

It is appreciated that the above-described subsidy methodology will never provide a credit to the user which exceeds his fixed charge.

WOIPM 724 typically has additional functionality in the environment of Fig. 12B, which may be understood as follows: In addition to the outputs received by data gatherer and sorter 760 from PPDC 750, GWDC 752, FWDC 754 and RTDC 756, WOIPM 724 also receives CPGW/SCMD data from service center 740. This data typically relates to end-to-end secure wireless-Internet sessions and is supplied to service center 740 by CPGW collector 822 (Fig. 12B). The CPGW/SCMD data supplied to WOIPM 724 by service center 740 typically includes session communications data, which relates to sessions handled by POP 716, firewall 720 and router 722. The CPGW/SCMD data is supplied by service center 740 to data gatherer and sorter 760 via manager 768. Data gatherer and sorter 760 cooperates with database 762 to determine which portions of the outputs received from PPDC 750, GWDC 752, FWDC 754 and RTDC 756, as well as the CPGW/SCMD data received from service center 740, are retained.

Generally speaking, only information relating to web sites which provide subsidized wireless-Internet access is relevant. A list of such web sites, including preferably both their relevant URLs and IP addresses, is entered by service center 740 via manager 768 into database 762, stored thereat and accessed by the data gatherer and sorter 760.

If, for a given session, URL information is received as part of the GW/SCMD data from GWDC 752, the session is considered to be a non-end-to-end secure wireless-Internet session and the CPGW/SCMD data received from service center 740 is not relevant, inasmuch as the URL information received as part of the GW/SCMD data
from GWDC 752 is sufficient to enable a determination to be made as to whether the session is subsidized.

If, however for a given session, URL information is not received in the GW/SCMD data from GWDC 752, the session is considered to be an end-to-end secure wireless-Internet session and the CPGW/SCMD data received from service center 740 is normally relevant. Once a determination has been made as to whether a session is subsidized, the telephone number of the wireless-Internet communicator 710 or 828 (Fig. 12B) to which the subsidy is to be credited must be determined. This is normally done by a transaction analyzer 764, in cooperation with the database 762, utilizing the PP/SCMD data received from PPDC 750 via data gatherer and sorter 760.

Reference is now made to Fig. 14 which illustrates the service center 740 (Figs. 12A and 12B) in an environment shown in Fig. 12B including a multiplicity of WOIPMs 724 which are associated with a multiplicity of different wireless network operators/wireless ISPs, a multiplicity of icon generators 742 and fraud monitors 744 which are associated with a multiplicity of different content/application provider facilities 712 or content/application provider facilities 820, as well as icon generators 824, phantom object generators (POGs) 826 and CPGW collectors 822 which are associated with a multiplicity of different content/application provider facilities 820.

As seen in Fig. 14, a service center messaging and security subsystem 770 communicates with WOIPMs 724, CPGW collector 822 and fraud monitors 744.

The service center 740 typically has at least some and preferably has all of the following principal functions:

I. Via a billing subsystem 774, which receives data from database 772, the service center 740 generates billing outputs to be sent to content/application providers participating in the subsidy program. The data received from database 772 typically includes:

A. Un-rated WI-800 session information, including, inter alia, the total duration of sessions, the total number of packets, the time stamp and the subscriber identification.
B. Rates per minute, per packet or a combination thereof, agreed upon between the content/application provider facility 712 (Figs. 12A and 12B) or 820 (Fig. 12B) and the operator/ISP of wireless network 714 (Fig. 12A and 12B) involved with the specific session.

II. The service center 740 provides updates to the various icon generators 742, icon generators 824 and fraud monitors 744, notifying them of changes in a roster and in setup parameters of wireless network operators/wireless ISPs equipped with WOIPMs 724 which participate in the subsidized wireless-Internet access program. Additional updates may be provided by service center 740 to WOIPMs 724, icon generators 824 and POGs 826, notifying them of changes in a roster and setup parameters of content/application provider facilities 712 (Figs. 12A and 12B) or 820 (Fig. 12B), which participate in the subsidized wireless-Internet access program. The updates may also be triggered by the service center manager 776.

III. The service center 740 receives CPGW/SCMD data from various CPGW collectors 822. The CPGW/SCMD data is transferred to database 772 and is sorted there by wireless network operator/ISP operating wireless network 714. The sorted data is then distributed via the SC messaging & security subsystem 770 to the corresponding WOIPMs 724.

IV. The service center 740 employs a fraud detector 778, which receives information from database 772 and which detects unusual levels of subsidies to given users. The fraud detector 778 may interface via the service center messaging and security subsystem 770 with fraud monitors 744 to obtain an indication of whether a user obtaining a subsidy in respect of a session with a given web site in fact visited that web site.

Alternatively or additionally, in non-end-to-end secure wireless-Internet environment, fraud detector 778 may obtain from a WOIPM 724 an indication of whether a user obtaining a subsidy in respect of a session with a given web site in fact visited that web site in the following manner: fraud detector 778 interrogates database 762 (Fig. 13) of WOIPM 724. If the SSS SDR of a suspect session series is matched
with GW/SCMD data of a phantom object download received from a wireless-Internet gateway 718 (Fig. 12B), the SSS SDR is considered to be non-fraudulent.

Alternatively or additionally, in end-to-end secure wireless-Internet environment, fraud detector 778 may obtain from a WOIPM 724 an indication of whether a user obtaining a subsidy in respect of a session with a given web site in fact visited that web site in the following manner: fraud detector 778 interrogates database 762 (Fig. 13) of WOIPM 724. If the SSS SDR of a suspect session series is matched with CPGW/SCMD data of a phantom object download received from a CPGW collector 822, the SSS SDR is considered to be non-fraudulent.

The functionality of the service center 740 as described hereinabove preferably involves a set up procedure which establishes the following parameter for each of the portals offering WI-800 functionality to their content/application providers:

t. the URL of web pages containing links to such content/application providers.

The functionality of the service center 740 as described hereinabove preferably involves a set up procedure which establishes the following parameters for each of the WI-800 participating wireless network operators/wireless ISPs:

u. the IP address of each wireless-Internet gateway 718 (Figs. 12A and 12B);

v. the IP address of each WOIPM 724 (Figs. 12A and 12B);

w. the IP addresses assigned by each POP 716 (Figs. 12A and 12B) to users; and

x. the global IP addresses assigned by each firewall 720 (Figs. 12A and 12B).

Parameters u., w. and x. are updated at the service center 740 via manager 776 and such updates are automatically provided by the service center 740 to all icon generators 742, icon generators 824 and fraud monitors 744. Parameters w. and x. are also used by the service center database 772 for sorting CPGW/SCMD data, received by the service center, according to wireless network operators/wireless ISPs. Parameter v. is used for addressing the sorted CPGW/SCMD data to the corresponding WOIPMs 724.

The functionality of the service center 740 as described hereinabove preferably also involves a set up procedure which establishes the following parameters for each of
the WI-800 participating content/application provider facilities 712 (Figs. 12A and 12B) and 820 (Fig. 12B):

y. the IP address of a content/application server forming part of the content/application provider facility 712 (Figs. 12A and 12B) or 820 (Fig. 12B);s;

z. the IP address of any load balancer forming part of the content/application provider facility 712 (Fig. 12A and 12B) or 820 (Fig. 12B); 

aa. the IP address of any content/application provider specific wireless-Internet gateway (CPGW) forming part of the content/application provider facility 712 (Figs. 12A and 12B) or 820 (Fig. 12B); and

bb. the IP address of each fraud monitor 744 (Figs. 12A and 12B).

Parameters y., z. and aa. are updated at the service center 740 via manager 776 and such updates are automatically provided by the service center 740 to all WOIPMs 724, icon generators 824 and POGs 826.

Reference is now made to Fig. 15, which is a simplified block diagram illustration of a content/application provider facility 712 associated with the fraud monitor 744 and service center 740 in the embodiment of Figs. 12A, 12B and 14.

As seen in Fig. 15, the content/application provider facility 712 (Fig. 12A and 12B) preferably comprises one or more content/application servers 800. If the content/application provider facility 712 is a relatively small facility, one server 800 is provided. If, however the content/application provider facility 712 is relatively large, then multiple servers 800 are provided together with a load balancer 802 for allocating load among the multiple servers 800.

In environments where end-to-end security is required between the content/application provider facility 712 and the wireless-Internet communicator 710 (Fig. 12A and 12B), a content/application provider wireless-Internet gateway (CPGW) 804 is provided as part of the content/application provider facility 712. Normally only end-to-end secure sessions are routed via CPGW 804, while non-end-to-end secure sessions are routed directly by the wireless-Internet gateway 718 (Fig. 12A and 12B) to the content/application servers 800 via the load balancer 802.
Each server 800 provides an output in respect of each session to the fraud monitor 744 (Fig. 12A and 12B), which preferably comprises a data gatherer and analyzer 810, interfacing with a database 812 and outputting to a messaging and security subsystem 814, which, in turn, communicates with service center 740 (Fig. 12A and 12B).

The output from each server 800 to fraud monitor 744 is termed FM/SCMD data and preferably includes the following parameters:

- cc. the source IP address of each session request as identified by server 800;
- dd. the source IP address appearing in the HTTP header of the request, if present;
- ee. the URL requested in each session request;
- hh. the time stamp assigned to each session request by server 800.

Parameters cc., dd., ee. and hh. are received by the data gatherer and analyzer 810 which screens these parameters to discard sessions not involving a participating wireless network operator/wireless ISP. This screening is preferably accomplished by comparing session parameters cc. and dd. with parameters u., w. and x. received from service center 740. Parameters cc., dd., ee. and hh. for sessions which do involve a participating wireless network operator/wireless ISP are stored in database 812 for a predetermined period, for example one month.

When there exists a suspicion of fraud according to predetermined criteria established at the service center 740, the service center 740 interrogates, typically by means of a fraud monitor interrogation request (FM/IR), the database 812 of the appropriate fraud monitor 744 via the messaging and security subsystem 814. The interrogation typically involves a request for parameters cc., dd., ee. and hh. in respect of a given user employing the services of a given wireless network operator/wireless ISP, as defined by a specific combination of parameters a., h., r. and u. supplied by the service center 740 to the fraud monitor 744. The interrogation request FM/IR normally specifies a time period over which such parameters are required, typically a week or more.
Items y., z., a.a. and b.b. are typically used by service center 740 to identify the appropriate fraud monitor 744 to be interrogated regarding a given session. The service center typically maintains a look-up table which links all the IP addresses associated with various content/application provider facilities (712) with the IP addresses of corresponding fraud monitors (744).

In response to the interrogation request (FM/IR) the fraud monitor 744 normally provides the parameters c.c., d.d., e.e. and h.h. which match the received combination of parameters a.a., h.h., r.r. and u.u. over the requested period of time. The fraud monitor 744 may also provide one or more of the following relevant parameters relating to facility 712 with each response to an interrogation request: y.y., z.z. and b.b.

The service center 740 investigates the existence of fraud by first making the following inquiries:

1. Does parameter b.b. of a suspected fraudulent session match parameter e.e. for such session?

2. Do any of parameters c.c. and m.m. of a suspected fraudulent session match any of parameters y.y., z.z. and a.a. for such session?

3. Do any of parameters u.u., r.r. and h.h. of a suspected fraudulent session match parameter d.d. for such session?

4. Do any of parameters u.u., r.r., h.h. and a.a. of a suspected fraudulent session match parameter c.c. for such session?

5. Do any of parameters s.s., p.p., j.j. or g.g. of a suspected fraudulent session match parameter h.h. for such session?

If the answers to either of inquiries 1. and 2. are yes and the answers to either of inquiries 3. and 4. are yes and the answer to inquiry 5. is yes, fraud is determined not to exist. Otherwise, fraud is determined to exist.

It is appreciated that database 812 of fraud monitor 744 is preferably cleared of unnecessary information as and when set up and stored at database 812 by service center 740.
Reference is now made to Fig. 16, which is a simplified block diagram illustration of a content/application provider facility 712 associated with the icon generator 742 and service center 740 in the embodiment of Figs. 12A and 12B.

As seen in Fig. 16, the content/application provider facility 712 (Fig. 12A and 12B) preferably comprises one or more content/application servers 800. If the content/application provider facility 712 is a relatively small facility, one server 800 is provided. If, however the content/application provider facility 712 is relatively large, then multiple servers 800 are provided as well as a load balancer 802 for allocating load thereto.

In environments where end-to-end security is required between the content/application provider facility 712 and the wireless-Internet communicator 710 (Fig. 12A and 12B), a content/application provider wireless-Internet gateway (CPGW) 804 is provided at the content/application provider facility 712. Normally only end-to-end secure sessions are routed via CPGW 804, while non-end-to-end secure sessions are routed by the wireless-Internet gateway 718 (Fig. 12A and 12B) directly to the content/application server 800 via the load balancer 802, if present.

Server 800 provides an output indicating the IP address of the wireless network operator/wireless ISP for each session to icon generator 742 (Fig. 12A and 12B), which uses it for making a determination whether an icon should be displayed to the user. When a CPGW 804 is present in facility 712, the CPGW must be configured to provide to server 800, as part of the HTTP header of each user request passing through it, the source IP address received by it with the session request.

The output from server 800 to the icon generator 742 thus typically includes parameters cc. and dd., mentioned above with reference to Fig. 15 as well as the following additional parameter:

ii. the referrer URL, such as a URL of a portal affecting the session at server 800.

The icon generator 742 compares, for each session, parameters cc. and dd., with parameters u., w. and x. received by it from service center 742. If a match is found it activates a WI-800 icon.
The icon generator 742 also compares, for the first session of a subsidized session series in which an icon is displayed, parameter ii. with parameters t. received by it from service center 742. If a match is found it preferably activates for all the sessions of the subsidized session series, a special WI-800 icon which includes an identification of a portal involved in affecting the first session.

Reference is now made to Fig. 17, which is a simplified block diagram illustration of a content/application provider facility 820 (Fig. 12B) associated with a CPGW collector 822 (Fig. 12B), a service center 740 (Fig. 12B) and a WOIPM 724 (Fig. 12B) in the embodiment of Fig. 12B.

As seen in Fig. 17, the content/application provider facility 820 includes a CPGW 854, which interfaces with CPGW collector 822. As already explained with reference to Fig. 16, in an environment where end-to-end security is required, sessions are routed from POP 716 (Fig. 12B) directly to CPGW 854 and from there to content/application server 850, via load balancer 852, if present.

CPGW 854 provides CPGW collector 822 with CPGW/SCMD data for all session requests received by CPGW 854. Such data typically includes:

hh. the source IP address associated with the session request as identified by CPGW 854;

ii. the URL associated with the session;

jj. the destination IP address associated with the session as identified by CPGW 854;

kk. the dynamic parameter appearing as a suffix to the session request, if present;

ll. total number of bytes sent to content/application provider facility 820 from the wireless-Internet communicator 710 or 828 (Fig. 12B) as a session request, as identified at CPGW 854;

mm. total number of bytes sent from content/application provider facility 820 to the wireless-Internet communicator 710 or 828 (Fig. 12B) in response to the session request, as identified at CPGW 854; and

nn. the time stamp assigned to the session by CPGW 854.
CPGW collector 822 supplies the CPGW/SCMD data to service center 740. Item hh. is typically used by service center 740 to sort the CPGW/SCMD data for the purpose of distributing it to WOIPMs 724 of various wireless network operators/ISPs. The service center typically maintains a look-up table which links parameters w. and x. of each wireless network operator/ISP with parameter v. of the corresponding WOIPM 724. Parameter hh. is correlated with parameters w. or x. for identifying the wireless network operator/ISP and the associated CPGW/SCMD data is transmitted to the corresponding WOIPM 724 according to parameter v.

WOIPM 724 correlates the CPGW/SCMD data with the PP/SCMD data and FW/SCMD data for matching the user’s telephone number in a manner similar to that described with reference to Figs. 12A and 13, as follows: for all sessions requests in which URL data is not provided in the GW/SCMD data, the WOIPM 724 matches CPGW/SCMD data having typically at least items hh. and nn. with FW/SCMD data having typically at least items r. and s.. Then the WOIPM 724 matches the corresponding FW/SCMD data items q. and s. with PP/SCMD data having typically at least items h. and j. In this way, items ii., II., mm. and nn. are correlated with item k.

It is appreciated that the sorting and matching process carried out with respect to the CPGW/SCMD data provides a powerful tool for associating a user's telephone number with user visits to sites that provide WI-800 subsidized wireless-Internet access in end-to-end secure wireless-Internet communications environment.

Reference is now made to Figs. 18A and 18B, which are simplified block diagram illustrations of subsidized access icon provisioning functionality preferably employing a content/application provider facility 820 (Fig. 12B) associated with an icon generator 824 (Fig. 12B), a service center 740 (Fig. 12B), a wireless Internet gateway 718 (Fig. 12B), an Internet point of presence 716 (POP) (Fig. 12B), a wireless network 714 (Fig. 12B) and a wireless-Internet communicator 710 (Fig. 12B).

As seen in Figs. 18A and 18B, the content/application provider facility 820 preferably comprises one or more content/application servers 850. If the content/application provider facility 820 is a relatively small facility, one server 850 is provided. If, however, the content/application provider facility 820 is relatively large,
multiple servers 850 are provided together with a load balancer 852 for allocating load between the multiple servers 850.

In environments where end-to-end security is required between the content/application provider facility 820 and the wireless-Internet communicator 710, a content/application provider wireless-Internet gateway (CPGW) 854 is provided at the content/application provider facility 820. Normally only end-to-end secure sessions are routed via CPGW 854 (Fig. 18B), while non-end-to-end secure sessions are routed by the wireless-Internet gateway 718 directly to the content/application servers 850 via the load balancer 852 (Fig. 18A).

Icon generator 824 may be implemented in a web server configured with application software for providing the functionality described herein and is typically connected to the Internet and also receives updates from service center 740. The functionality of icon generator 824 preferably involves a set up procedure, which establishes at least two icon objects thereat. The icon objects may be HTML objects when content/application provider facilities 820 are HTML-based, WML objects when content/application provider facilities 820 are WAP-based or any other suitably formatted objects. A first icon object typically includes a subsidized access icon agreed upon between the operator/ISP operating wireless network 714 and the content/application provider facility 820. A second icon object type is typically empty and has no content, and is therefore termed a blank icon.

The functionality of icon generator 824 preferably involves a set up procedure which establishes the following parameter for each of the WI-800 participating content/application provider facilities 820 associated with icon generator 824:

- an unambiguous identifier for content/application provider facility 820.

The functionality of icon generator 824 also preferably involves a set up procedure which establishes the following parameters for each of the WI-800 participating operators/ISPs of wireless network 714 having a WI-800 agreement with content/application provider facilities 820 associated with icon generator 824:

- the IP address of each wireless-Internet gateway 718;

- the IP addresses assigned by each POP 716 to users; and
rr. the global IP addresses assigned by each firewall 720 (Fig. 12B).

The functionality of icon generator 824 additionally preferably involves a set up procedure at content/application provider facility 820, which includes incorporation of an HTTP link at each location on a web page of a content/application server 850, at which location an icon is to be displayed. Each such icon-generating link is configured to request an icon object from icon generator 824, such request including a dynamic parameter indicating the identifier oo. of content/application provider facility 820. This dynamic parameter is typically provided in the form of a suffix to the request as shown in the following example of an icon-generating link request:

www.[dynamic URL of icon generator 824]?[a dynamic parameter indicating the identifier of content/application provider facility 820].

The functionality of icon generator 824 additionally preferably involves a set up procedure at CPGW 854 in which CPGW 854 is configured as appropriate to automatically introduce the source IP address received thereby with each session request into the HTTP header of the corresponding request generated thereby.

As seen in Fig. 18A, in non-end-to-end secure sessions, when a user, employing a browser on wireless-Internet communicator 710 requests a given web page, a user's request, indicated by an arrow 860, is transmitted via POP 716 to wireless-Internet gateway 718. Wireless-Internet gateway 718, in turn, generates a corresponding request, indicated by an arrow 862, via the Internet to a corresponding content/application server 850 of content/application provider facility 820. The content/application server 850 downloads the requested web page, as indicated by an arrow 864, to wireless-Internet gateway 718, which in turn downloads it via POP 716 to wireless-Internet communicator 710, as indicated by an arrow 866.

If the browser on the wireless-Internet communicator 710 identifies an icon-generating link on the downloaded web page, it automatically generates a further request, indicated by an arrow 868, which is directed via POP 716 to wireless-Internet gateway 718. Wireless-Internet gateway 718, in turn, directs a corresponding request to icon generator 824, as indicated by an arrow 870.

Icon generator 824 preferably identifies the following parameters associated with the request indicated by arrow 870;
ss. the source IP address associated with the request;

tt. the source IP address appearing in the HTTP header of the request, if present;

and

uu. the dynamic parameter appearing as a suffix to the session request.

Icon generator 824 compares parameter uu. with parameters oo. stored at icon generator 824 during its set up procedure, for identifying the content/application provider facility 820 involved in originating the icon-generating link.

Icon generator 824 also compares parameters ss. and tt. with parameters pp., qq. and rr. for identifying the wireless network operator/wireless ISP involved in the session. In the case of the non-end-to-end secure wireless-Internet environment shown in Fig. 18A, parameter ss. is typically used for identifying the wireless network operator/wireless ISP involved in the session.

Following identification of the content/application provider facility 820 and the wireless network operator/wireless ISP involved in the session, icon generator 824 checks a look-up table to determine whether these parties have an agreement for subsidizing wireless-Internet access and to determine which icon object was agreed upon between such parties for indicating WI-800 wireless-Internet access subsidy to users employing wireless-Internet communicators 710.

If the look-up table indicates that indeed the given facility 820 has a subsidy agreement with the given operator/ISP of wireless network 714, the icon generator 824 downloads the icon object agreed upon between the parties, as indicated by an arrow 872, to wireless-Internet gateway 718, which in turn downloads it via POP 716 to wireless-Internet communicator 710, as indicated by an arrow 874. The subsidized access icon object is, consequently, superimposed on the web page, which includes the corresponding icon-generating link.

If the look-up table indicates that given facility 820 does not have a subsidy agreement with given operator/ISP of wireless network 714, a blank icon is downloaded to gateway 718 and consequently to wireless-Internet communicator 710, with the result that the user does not see any icon indicating subsidization.
As seen in Fig. 18B, in end-to-end secure sessions, when a user employing a browser on wireless-Internet communicator 710 requests a given web page, a user's request, indicated by an arrow 880, is transmitted via POP 716 to CPGW 854 of content/application provider facility 820. CPGW 854, in turn, generates a corresponding request, indicated by an arrow 882, to a corresponding content/application server 850 via load balancer 882. The content/application server 850 downloads the requested page, as indicated by an arrow 884, to CPGW 854, which in turn downloads it via the Internet and POP 716 to wireless-Internet communicator 710, as indicated by an arrow 886.

If the browser on the wireless-Internet communicator 710 identifies an icon-generating link on the downloaded web page, it automatically generates a further request, indicated by an arrow 888, which is directed via POP 716 and the Internet to CPGW 854. CPGW 854, in turn, directs a corresponding request to icon generator 824, as indicated by an arrow 890. Icon generator 824 downloads a subsidized access icon or a blank icon, as indicated by an arrow 892, to CPGW 854, which in turn downloads it via POP 716 to wireless-Internet communicator 710, as indicated by an arrow 894.

Icon generator 824 preferably uses the same methodology described hereinabove with reference to Fig. 18A for determining whether to download a subsidized access icon or a blank icon to wireless-Internet communicator 710 and for determining which subsidized access icon to download, except that in this example of an end-to-end secure wireless-Internet environment, parameter tt. is typically used for identifying the wireless network operator/wireless ISP involved in the session.

It is to be appreciated from the icon provisioning functionality described hereinabove that icon generator 824 may download different subsidized access icons to different content/application provider facilities 820 in the environment of multiple operators/ISPs of wireless networks 714 and multiple content/application provider facilities 820. In fact, each combination of a content/application provider facility 820 and an operator/ISP of wireless network 714 may evoke a different subsidized access icon.

It is also to be appreciated that for various purposes, such as for the purpose of distributing load, there may exist a plurality of icon generators 824 (Figs. 18A and 18B),
each of which may be associated with a specific combination of a content/application provider facility 820 (Figs. 18A and 18B) and an operators/ISP of wireless networks 714 (Figs. 18A and 18B).

Reference is now made to Figs. 19A and 19B, which are simplified block diagram illustrations of a content/application provider facility 820 (Fig. 12B) associated with a phantom object generator (POG) 826 (Fig. 12B), a service center 740 (Fig. 12B), a wireless-Internet gateway 718 (Fig. 12B), an Internet point of presence 716 (Fig. 12B), a wireless network 714 (Fig. 12B) and a wireless-Internet communicator 828 (Fig. 12B) which includes a cache memory 830 (Fig. 12B).

As seen in Figs. 19A and 19B, the content/application provider facility 820 (Fig. 12B) preferably comprises one or more content/application servers 850. If the content/application provider facility 820 is a relatively small facility, one server 850 is provided. If, however the content/application provider facility 820 is relatively large, multiple servers 850 are provided together with a load balancer 852 for allocating load among servers 850.

In environments where end-to-end security is required between the content/application provider facility 820 and the wireless-Internet communicator 828, a content/application provider wireless-Internet gateway (CPGW) 854 is provided at the content/application provider facility 820. Normally only end-to-end secure sessions are routed via CPGW 854 (Fig. 19A), while non-end-to-end secure sessions are routed by the wireless-Internet gateway 718 directly to the content/application servers 850 via the load balancer 852 (Fig. 18B).

POG 826 may be implemented in a web server configured with suitable application software for providing the functionality described herein and is typically connected to the Internet and receives updates from service center 740. The functionality of POG 826 preferably involves a set up procedure, which establishes a dedicated object at POG 826 for each of the WI-800 participating content/application provider facilities 820 associated with POG 826. The object, which may be an HTML object when content/application provider facility 820 is HTML-based, a WML object when content/application provider facility is WAP-based or any other suitably formatted
object, typically does not include any content and is therefore termed a phantom object. The URL of each such phantom object is typically:

[POG 826 home page]/[identifier of content/application provider facility 820].

The functionality of POG 826 also preferably involves a setup procedure at content/application provider facility 820, which preferably includes incorporation of an HTTP link typically at each web page for which WI-800 wireless-Internet access subsidy is provided. Each such phantom object-generating link is configured to automatically request the corresponding phantom object established for that content/application provider facility 820 at POG 826. The request preferably includes a dynamic parameter indicating the URL of the web page originating the link. This dynamic parameter is typically provided in the form of a suffix to the request as shown in the following example of a phantom object-generating link request:

www.[POG 826 home page]/[identifier of content/application provider facility 820]?URL=[URL of the link originating web page, for which WI-800 subsidy is provided].

As seen in Fig. 19A, in non-end-to-end secure sessions, when a user, employing a browser on wireless-Internet communicator 828, requests a given web page, a user's request, indicated by an arrow 900, is transmitted via POP 716 to wireless-Internet gateway 718. Wireless-Internet gateway 718, in turn, generates a corresponding request, indicated by an arrow 902, via the Internet to a corresponding content/application server 850 of content/application provider facility 820. The content/application server 850 downloads the requested page, as indicated by an arrow 904, to wireless-Internet gateway 718, which in turn downloads it via POP 716 to wireless-Internet communicator 828, as indicated by an arrow 906.

If the browser on the wireless-Internet communicator 828 identifies a phantom object-generating link on the downloaded web page, it automatically generates a further request, indicated by an arrow 908, which is directed via POP 716 to wireless-Internet gateway 718. Wireless-Internet gateway 718, in turn, directs a corresponding request to POG 826, as indicated by an arrow 910. POG 826 downloads the requested phantom object, as indicated by an arrow 912, to wireless-Internet gateway 718, which in turn
downloads it via POP 716 to wireless-Internet communicator 828, as indicated by an arrow 914.

Consequently, the phantom object is superimposed on the web page which included the phantom object-generating link. However, as the phantom object does not include any content, the user's view of the web page is unaffected by it.

As seen in Fig. 19B, in end-to-end secure sessions, when a user, employing a browser on wireless-Internet communicator 828 requests a given web page, a user's request, indicated by an arrow 920, is transmitted via POP 716 and the Internet to CPGW 854 of content/application provider facility 820. CPGW 854, in turn, generates a corresponding request, indicated by an arrow 922, to a corresponding content/application server 850, via load balancer 852. The content/application server 850 downloads the requested page, as indicated by an arrow 924, to CPGW 854, which in turn downloads it via the Internet and POP 716 to wireless-Internet communicator 828, as indicated by an arrow 926.

If the browser on the wireless-Internet communicator 828 identifies a phantom object-generating link on the downloaded web page, it automatically generates a further request, indicated by an arrow 928, which is directed via POP 716 and the Internet to CPGW 854. CPGW 854, in turn, directs a corresponding request to POG 826, as indicated by an arrow 930. POG 826 downloads the requested phantom object, as indicated by an arrow 932, to CPGW 854, which in turn downloads it via POP 716 to wireless-Internet communicator 828, as indicated by an arrow 934.

It is to be appreciated that POG 826 is configured such that the phantom object is normally never downloaded from the cache memory 830 of wireless-Internet communicator 828 but rather from the POG 826. This functionality is achieved by embedding, in all phantom objects of POG 826, HTTP parameters which prevent such objects from being downloaded from the cache memory for display purposes. Such HTTP parameters are for example: AddHeader "Pragma"; "no-cache"; CacheControl = "no-cache, must-revalidate"; CacheControl = "max-age=0"; CacheControl = "private"; and Expires = -1.

GW/SCMD session communication data (Fig. 12B), associated with request 908 (Fig 19A) generated by a phantom object-generating link, is provided by wireless-
Internet gateway 718 (Fig. 12B) to WOIPM 724 (Fig. 12B). The URL of the web page for which WI-800 subsidy is provided, which URL is embedded in a dynamic parameter of each such request, is typically provided to WOIPM 724 as item d.. WOIPM 724 (Fig. 12B) preferably checks item b., received by it as part of the GW/SCMD data for the session associated with request 908 (Fig. 19A), against a list of all URLs of all associated POGs 826, for determining whether the request is intended for one of associated POGs 826

If the request is indeed identified as being intended for one of the associated POGs 826, WOIPM 724 replaces item b. in the GW/SCMD data (Fig. 12B) with item d., indicating the URL of the web page that includes the phantom object-generating link. The modified GW/SCMD data is typically logged and stored in database 762 (Fig. 13) of WOIPM 724 (Fig. 12B) with a proper “POG generated” identifier, which enables WOIPM 724 to identify the GW/SCMD data as being associated with a phantom object request.

It is to be appreciated that request 908 (Fig. 19A) typically includes an appropriate security mechanism which enables WOIPM 724 (Fig. 12B) to verify that the request 908 was indeed originated by a phantom object-generating link at content/application provider facilities 820 (Fig. 12B) of the present invention.

Similarly, CPGW/SCMD session communication data (Fig. 12B) associated with request 928 (Fig 19B), generated by a phantom object-generating link, is provided by CPGW 854 (Fig. 12B) to CPGW collector 822 (Fig. 12B). The URL of the web page for which a WI-800 subsidy is provided, which URL is embedded in a dynamic parameter of each such request, is typically also provided to CPGW collector 822 as item kk.. CPGW collector 822 (Fig. 12B) preferably supplies the CPGW/SCMD data to the corresponding WOIPM 724 (Fig. 12B) via service center 740 (Fig. 12B), as described hereinabove with reference to Fig. 17. WOIPM 724 (Fig. 12B) preferably checks item b., received by it as part of the CPGW/SCMD data associated with request 928 (Fig. 19B), against a list of all URLs of all associated POGs 826 maintained thereat, for determining whether the request is intended for one of the associated POGs 826.

If the request is indeed identified as being intended for one of the associated POGs 826 WOIPM 724 replaces item ii. in the CPGW/SCMD data(Fig. 12B) with item
kk., indicating the URL of the web page that includes the phantom object-generating link. The modified CPGW/SCMD data is typically logged and stored at the database 762 (Fig. 13) of WOIPM 724 (Fig. 12B) with a proper “POG generated” identifier, which enables WOIPM 724 to identify the CPGW/SCMD data as being associated with a phantom object request.

It is also to be appreciated that request 928 (Fig. 19B) typically includes an appropriate security mechanism which enables CPGW collector 822 (Fig. 12B) to verify that request 928 was indeed originated by a phantom object-generating link at a content/application provider facility 820.

The functionality described hereinabove with reference to Figs. 19A and 19B is preferably utilized for the following purposes:

I Ensuring that a proper subsidy is paid in respect of a web page downloaded from cache memory 830 (Fig. 12B) of wireless-Internet communicator 828 (Fig. 12B) in a non-end-to-end secure wireless-Internet environment. In this case, display of the web page would not normally be noted by wireless-Internet gateway 718 (Fig. 12B). However the GW/SCMD data (Fig. 12B) relating to request 908 (Fig 19A) provides all the necessary information for recording the page display.

II Ensuring that a proper subsidy is paid in respect of a web page downloaded from cache memory 830 (Fig. 12B) of wireless-Internet communicator 828 (Fig. 12B) in an end-to-end secure wireless-Internet environment. In this case, display of the web page would not normally be noted by CPGW collector 822 (Fig. 12B), however the CPGW/SCMD data (Fig. 12B) relating to request 928 (Fig 19B) provides all the necessary information for recording the page display.

III Preventing fraud. As a phantom object download can only be activated by a WI-800 web page download, identification of a phantom object download verifies download of the corresponding WI-800 web page. When there exists a suspicion of fraud according to predetermined criteria, the service center 740 (Fig. 12B) may send an interrogation request to WOIPM 724 (Fig. 12B) for “POG generated” GW/SCMD data and “POG generated” CPGW/SCMD data, which is associated with suspected sessions.
Such “POG generated” GW/SCMD data and “POG generated” CPGW/SCMD data received from WOIPM 724 (Fig. 12B) is used by service center 740 to determine whether the user actually visited the subsidized site at the corresponding time.

The interrogation request is preferably made by service center 740 (Fig. 12B) to the database 762 (Fig. 13) of the appropriate WOIPM 724 (Fig. 12B) via the messaging and security subsystem 814 (Fig. 14).

The interrogation request typically involves a request for “POG generated” GW/SCMD data parameters b. and g. that match non-“POG generated” parameters b. and g., and a request for “POG generated” CPGW/SCMD data parameters ii., and nn. that match non-“POG generated” parameters ii. and nn.. The service center typically maintains a look-up table which links all the IP addresses associated with various operators/ISPs of wireless networks 714 with the IP addresses of corresponding WOIPMs. If a match is found for all sessions of a SSS SDR, the SSS SDR is considered to be non-fraudulent.

It is appreciated that database 762 (Fig. 13) of WOIPM 724 (Fig. 12B) is preferably cleared of unnecessary “POG generated” GW/SCMD data and “POG generated” CPGW/SCMD data as and when determined by service center 740 (Fig. 12B).

It is also appreciated that for various purposes, such as for the purpose of distributing load, there may exist a plurality of POGs 826 (Figs. 19A and 19B), each of which may be associated with a selected combination of a content/application provider facility 820 (Figs. 19A and 19B) and an operators/ISPs of wireless networks 714 (Figs. 19A and 19B).

Reference is now made to Figs. 20A - 20C, which are simplified flow charts illustrating the operation of the WOIPM 724, in the environment shown in Fig. 12A, in a subsidized access wireless-Internet environment.

As seen in Fig. 20A, the WOIPM 724 initially determines whether the GW/SCMD data received by it from wireless-Internet gateway 718 (Fig. 12A) contains URL data. If yes, indicating that the session is a non-end-to-end secure session, the WOIPM matches the URL data with data received from the service center and stored in
WOIPM database 762 (Fig. 13) to determine whether the URL qualifies for a WI-800 subsidy, considering when appropriate, the association of the user to a subsidy qualifying group or the fact that the user has completed a transaction at content/application provider facility 712.

If the URL does qualify for WI-800 subsidy, the WOIPM 724 correlates the GW/SCMD data with PP/SCMD data received by the WOIPM from the POP 716 and prepares a gateway based session detail record (GWSDR).

Preferably in parallel to the functionality of Fig. 20A, and as seen in Fig. 20B, the WOIPM 724 compares the destination IP address contained in the RT/SCMD data received from router 722 with data received from the service center and stored in WOIPM database 762 (Fig. 13) to determine whether the destination IP address relates to a participating content/application provider facility 712.

If the destination IP address does relate to a participating content/application provider facility 712, the WOIPM 724 correlates the RT/SCMD data with the FW/SCMD data received by the WOIPM from the firewall 720 and thereafter correlates the thus correlated RT/SCMD and FW/SCMD data with the PP/SCMD data received by the WOIPM from the POP 716 and thereafter prepares a router based session detail record (RTSDR).

Referring now to Fig. 20C, it is seen that the RTSDRs (Fig. 20B) are correlated with the GWSDRs (Fig. 20A) to eliminate duplication, which normally occurs in connection with non-end-to-end secure sessions. Following elimination of duplication, subsidized session series SDRs (SSS SDRs) are prepared by the WOIPM 724 and sent to the CCBS 730. The methodology employed by the WOIPM in preparation of SSS SDRs is based on the time intervals between SDRs, similarly to that described hereinabove for CSDM 140 (Fig. 9) with reference to Figs. 10A and 10F.

The process described hereinabove with reference to Figs. 20A - 20C, as well as the process of preparing SSS SDRs by WOIPM 724 are preferably performed in a near real-time manner to enable providing subsidy credits to pre-paid subscribers' accounts. WOIPM 724 preferably maintains a look-up table, which indicates for each subscriber's telephone number if the subscriber has a pre-paid or post-paid account. SSS SDRs relating to pre-paid subscribers are sent by WOIPM 724 in a near real-time manner to
CCBS 730 for applying the subsidy credits to their accounts. SSS SDRs relating to post-paid subscribers are typically sent to CCBS 730 on a periodic basis. Periodically the WOIPM sends SSS SDR reports to the service center 740 for enabling the service center 740 to bill content/application providers accordingly.

It is appreciated that the functionality described hereinafore with reference to Figs. 20A and 20B, as well as the functions shown in Fig. 20C of correlating GWSDRs with RTSDRs, preparing SSS SDRs and sending SSS SDRs to the CCBS for pre-paid subscribers are preferably performed in a near real-time manner to enable providing subsidy credits to pre-paid subscribers’ accounts. The function of sending SSS SDRs to the CCBS for post-paid subscribers need not be performed in near real-time and is normally carried out in a batch manner.

Reference is now made to Fig. 21, which is a simplified flow chart illustrating the operation of the service center 740 in the environment shown in Fig. 12A in a subsidized access wireless-Internet environment utilizing the SSS SDR reports received from the WOIPM 724.

Periodically the service center 740 compiles the SSS SDR reports received by it from various WOIPMs 724 and sorts them by content/application provider facilities 712. The service center 740 prepares a debit report for each such content/application provider facility 712, specifying each SSS SDR in respect of which a charge is made.

Reference is now made to Fig. 22, which is a simplified flow chart illustrating the operation of the icon generator 742 in the subsidized access wireless-Internet environment shown in Fig. 12A.

As seen in Fig. 22, upon commencement of a session, the icon generator receives data items cc., dd. and gg. from the server 800 (Fig. 16). The icon generator determines whether data items cc. and dd. relate to a participating wireless network operator/wireless ISP. If so, it activates a dynamic WI-800 icon on the web page accessed in the session. Icon generator 742 also determines whether data item gg. relates to a participating portal. If so, the icon activated is a special WI-800 icon, preferably including an indication of the identity of the participating portal.
Reference is now made to Fig. 23, which is a simplified flow chart illustrating the operation of the fraud monitor 744 as shown in Fig. 12A in a subsidized access wireless-Internet environment. As seen in Fig. 23, the fraud monitor 744 receives FM/SCMD data from content/application server 800 (Fig. 12A). The fraud monitor determines whether data items cc. and dd. relate to participating wireless network operators/wireless ISPs. If so, it saves the FM/SCMD data for the relevant sessions in database 812 (Fig. 16) for a predetermined period of time.

From time to time, the fraud monitor 744 receives interrogation requests (FM/IR) from the service center 740 (Fig. 12A) regarding suspected fraud. Upon receipt of such interrogation requests, the fraud monitor 744 provides to the service center, the requested FM/SCMD data stored in database 812 (Fig. 16) for the relevant sessions.

Reference is now made to Fig. 24, which is a simplified flow chart illustrating the operation of the service center 740 in the subsidized access wireless-Internet environment of Fig. 12A when fraud is suspected.

Upon receiving the requested FM/SCMD data from the fraud monitor 744, the service center 740 correlates the FM/SCMD data with SSS SDRs which represent suspected fraudulent sessions. If matches are found, the SSS SDRs are marked as not fraudulent. Otherwise, the suspected SSS SDRs are considered to be fraudulent.

Periodically, the service center 740 prepares reports relating to the fraudulent SSS SDRs and sends them to the relevant wireless network operators/wireless ISPs and content/application provider facilities 712 to enable correction of their accounting.

Reference is now made to Figs. 25A and 25B, which are simplified flow charts respectively illustrating operation of the service center 740 and of WOIPM 724 in the presence of CPGW collector 822 in a subsidized access wireless-Internet environment as shown in Fig. 12B.

As seen in Fig. 25A, the service center 740 receives CPGW/SCMD data from one or more CPGW collectors 822. Service center 740 sorts the CPGW/SCMD data by operator/ISP of wireless network 714 and distributes it to corresponding WOIPMs 724.

Turning now to Fig. 25B, WOIPM 724 matches URL data forming part of the CPGW/SCMD data with data received from the service center and stored in WOIPM
database 762 (Fig. 13) to determine whether the URL qualifies for a WI-800 subsidy, considering, as appropriate, the association of the user to a subsidy qualifying group or the fact that the user has completed a transaction at content/application provider facility 712.

If the URL does qualify for a WI-800 subsidy, the WOIPM 724 correlates the CPGW/SCMD data with the PP/SCMD data received by the WOIPM from the POP 716, the FW/SCMD data received by the WOIPM from firewall 720 and the RT/SCMD data received by WOIPM from the router 722. WOIPM 724 then prepares subsidized session series SDRs (SSS SDRs) preferably by employing a methodology based on the time intervals between SDRs, which is similar to that described hereinabove for CSDM 140 (Fig. 9) with reference to Figs. 10A and 10F. SSS SDRs are sent by WOIPM 724 (Fig. 12B) to CCBS 730 (Fig. 12B) and service center 740 (Fig. 12B) in a manner similar to that described hereinabove with reference to Fig. 20C.

Reference is now made to Fig. 26, which is a simplified flow chart illustrating the operation of the icon generator 824 in a subsidized access wireless-Internet environment as shown in Figs. 12B, 18A and 18B.

As seen in Fig. 26, the icon generator 824 receives, as part of an HTTP request, data items ss., tt. and uu.. The icon generator employs these parameters for identifying the participating content/application provider and wireless network operator/ISP. Icon generator 824 then checks a look-up table to determine whether the two parties have a WI-800 subsidy agreement. If indeed such an agreement exists, icon generator 824 downloads a subsidized access icon in response to the HTTP request. If, according to the look-up table, no such agreement exists, icon generator downloads a blank icon.

Reference is now made to Fig. 27, which is a simplified flow chart illustrating the operation of the service center 740 (Fig. 12B) in cooperation with POG 826 as shown in Fig. 12B, when fraud is suspected. When there exists a suspicion of fraud according to predetermined criteria established at the service center 740, the service center sends an interrogation request to the appropriate WOIPM 724. Upon receiving the requested “POG generated” GW/SCMD data and “POG generated” CPGW/SCMD data from the WOIPM 724, the service center 740 correlates this data with SSS SDRs.

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which represent suspected fraudulent sessions. To the extent that matches are found, the SSS SDRs are marked as not fraudulent. Otherwise, the suspected SSS SDRs are considered to be fraudulent.

Periodically, the service center 740 prepares reports relating to fraudulent SSS SDRs and sends them to the relevant wireless network operators/wireless ISPs and content/application provider facilities 820 to enable correction of their accounting.

Reference is now made to Fig. 28, which is a simplified illustration of the appearance on a wireless-Internet communicator of a multi-page web site useful in accordance with an embodiment of the present invention for enabling user-selective session subsidies and to Fig. 29, which is a simplified flow chart illustrating the functionality of WOIPM 724 (Fig. 12A) in providing user-selective session subsidies and employing the multi-page web site of Fig. 28.

The embodiment of Figs. 28 and 29 differs from embodiments described hereinabove wherein a subsidy is granted based on the identity of the URL, without relating to the identity of the user. The embodiment of Figs. 28 and 29 provides functionality for granting a subsidy for a given session, based not only on the identity of the URL but also on the identity of the user. Thus, it may be appreciated that, for example, customers of a bank, which operates a web site such as the web site illustrated in Fig. 28, may be classified, such as into Gold, Silver and Bronze categories, wherein only the Gold customers enjoy a subsidy. Another possible type of categorization may provide that new customers or new visitors to the web site enjoy a subsidy.

As seen in Fig. 28, the web site is preferably constructed to have at least one page, here identified by reference numeral 900, which can be accessed only by Gold customers. A user, such as a bank customer using his customer password, typically logs in on a log in page, designated by reference numeral 902 in Fig. 28. If the customer is identified by the bank's database on the basis of his password as a Gold customer, or for example alternatively based on a registration function recently completed as a new user or customer, he is directed to a preferred customer page, such as page 900. All other customers are directed to another page, such as page 904. The customers may then
proceed to various pages on the web site, including pages entitled to a WI-800 subsidy such as pages designated by reference numerals 906, 908, 910 and 912.

Turning additionally to Fig. 29, it is seen that in the embodiment of Figs. 28 and 29, the WOIPM 724 matches the URLs visited by a user with a first list, typically maintained at the WOIPM, which contains URLs of all web pages, such as pages 900, 906, 908, 910 & 912, for which a WI-800 wireless-Internet access user-selective subsidy is being made available. In addition, the WOIPM 724 preferably matches the URLs visited by a user with a second list, typically maintained thereat, which contains URLs of all web pages, such as page 900, which when accessed by a user, trigger an entitlement of that user to a subsidy when that user visits the pages on the first list, namely pages 900, 906, 908, 910 and 912.

The WOIPM 724 then determines which URLs of the first list were accessed by a user who also accessed a URL of the second list. Such URLs of the first list are thus identified as URLs for which a subsidy is provided to the user. These URLs are then matched with the user's telephone number by the WOIPM 724 to prepare appropriate SSS SDRs which typically cause subsidy credit to be credited to the account of that telephone number.

Reference is now made to Fig. 30, which is a simplified illustration of the appearance on a wireless-Internet communicator of a multi-page web site useful in accordance with an embodiment of the present invention for enabling transaction-based session subsidies and to Fig. 31, which is a simplified flow chart illustrating the functionality of WOIPM 724 (Fig. 12A) in providing transaction-based session subsidies and employing the multi-page web site of Fig. 30.

In this embodiment of the invention, a WI-800 wireless-Internet access subsidy is made available only for certain web pages and only for users who complete transactions at the subsidizing web site. Thus, it may be appreciated that, for example, customers of an on-line store which operates a web site, may receive a session subsidy only if they complete a purchase transaction.

In such a case, as seen in Fig. 30, the web site is preferably constructed to have at least one page, such as a purchase confirmation page, here identified by reference
numeral 950, which is and can be accessed only following completion of a purchase transaction. A user, such as a potential customer accesses one or more pages entitled to a WI-800 subsidy, which pages are identified by reference numeral 950, 952, 954, 956, 958, 960, 962, 964 & 966. If and only if the customer completes a purchase transaction, or optionally a purchase transaction of at least a given value, he is directed to a purchase confirmation page, such as page 950.

Turning additionally to Fig. 31, it is seen that in the embodiment of Figs. 30 and 31, the WOIPM 724 matches the URLs visited by a user with a first list, typically maintained thereat, which contains URLs of all web pages, such as pages 950, 952, 954, 956, 958, 960, 962, 964 & 966, for which a WI-800 wireless-Internet access transaction-based subsidy is being made available. In addition, the WOIPM 724 preferably matches the URLs visited by a user with a second list, typically maintained thereat, which contains URLs of all web pages, such as page 950, which when accessed by a user, trigger a subsidy entitlement of that user.

The WOIPM 724 then determines which URLs of the first list were accessed by a user who also accessed a URL of the second list. Such URLs of the first list are thus identified as URLs for which a subsidy is provided. These URLs are then matched with the user's telephone number by the WOIPM 724 to provide appropriate SSS SDRs which typically cause subsidy credit to be credited to the account of that telephone number.

Reference is now made to Fig. 32A and 32B, which illustrate two alternative modes of presentation of a subsidized access icon of the present invention on the screen of wireless-Internet communicator 710 (Figs. 12A and 12B) or 828 (Fig. 12B).

As seen in Fig. 32A, the subsidized access icon is typically displayed as part of a subsidized web page downloaded to the wireless-Internet communicator. Alternatively, as seen in Fig. 32B, the subsidized access icon may be displayed on a menu page adjacent to a menu item which includes a link to a subsidized web page. It is appreciated that in this latter embodiment, the user may know in advance that he is about to access a subsidized web site zone.
It is to be appreciated that in the systems and methodologies described herein, a WI-800 subsidy may be charged to a party which is not the content/application provider involved in the subsidized session, such as, for example, in the case of a third party sponsoring user visits to a web site.

It is also to be appreciated that the systems and methodologies described herein, may be used by an enterprise for enabling its mobile workforce accessing the enterprise’s Intranet without being charged for wireless-Internet access whereas the rest of their wireless-Internet activity is charged normally.

It is to be appreciated that the foregoing description with reference to Figs. 12A – 32B, may also apply, with applicable modifications, such as for example the existence of a proxy server instead of a wireless-Internet gateway, to an Internet environment which is not necessarily a wireless-Internet environment.

It will be appreciated by persons skilled in the art that the present invention is not limited by what has been particularly shown and described hereinabove. Rather the scope of the present invention includes both combinations and sub-combinations of the various features described hereinabove as well as variations and modifications which would occur to persons skilled in the art upon reading the specification and which are not in the prior art.
CLAIMS

1. In an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a methodology operative to subsidize Internet access costs in respect of interactions between a user and a web site, the methodology including:
   
   automatically communicating information relating to said interactions between a user and a web site; and
   
   utilizing said information for subsidizing wireless-Internet access costs.

2. A methodology according to claim 1 and wherein said information relating to said interactions is automatically communicated from said at least one intermediary.

3. A methodology according to claim 1 and wherein said web site subsidizes user Internet access charges of an ISP.

4. A methodology according to claim 1 and wherein said web site subsidizes user wireless-Internet access charges of a wireless network operator.

5. A methodology according to claim 1 and wherein said information is utilized for subsidizing at least one of packets count charges and time charges.

6. A methodology according to claim 1 and wherein said Internet environment is an end-to-end secure Internet environment.

7. A methodology according to claim 1 and wherein said Internet environment is a non-end-to-end secure Internet environment.
8. A methodology according to claim 1 and also comprising a fraud prevention functionality which determines whether a user receiving a subsidy in respect of an interaction actually participated in that interaction.

9. A methodology according to claim 8 and wherein said fraud prevention functionality includes the following functionalities:

   classifying users receiving subsidies over a predetermined threshold as suspect users; and

   determining, by using information received from websites, whether the suspect users actually participated in interactions in respect of which they were credited with a subsidy.

10. A methodology according to claim 1 and wherein said information relating to said interactions is automatically communicated from said at least one of an Internet point of presence, a wireless-Internet gateway, a content/application provider wireless-Internet gateway, a firewall and a router located at either an ISP or a wireless network operator facility.

11. A methodology according to claim 1 and wherein said information relating to said interactions is employed to determine whether a given interaction is entitled to a subsidy.

12. A methodology according to claim 10 and wherein said information relating to said interactions is also employed to determine telephone numbers of users participating in said interactions to which subsidies are to be credited.

13. A methodology according to claim 1 and wherein said information is communicated to a processing module which is located at either an ISP or a wireless network operator facility.
network operator facility and only part of said information is communicated from said processing module outside of either said ISP or a wireless network operator facility.

14. A methodology according to claim 13 and wherein information relating to the telephone numbers of users to which subsidies are to be credited is not communicated from said processing module outside of either said ISP or a wireless network operator facility.

15. In an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a system operative to subsidize Internet access costs in respect of interactions between a user and a web site, the system including:

   a data communicator automatically communicating information relating to said interactions between a user and a web site; and

   a subsidizing engine utilizing said information for subsidizing Internet access costs.

16. A system according to claim 15 and wherein said data communicator automatically communicates information from said at least one intermediary in respect of said interactions.

17. A system according to claim 15 and wherein said web site subsidizes user Internet access charges of an ISP.

18. A system according to claim 15 and wherein said web site subsidizes user wireless-Internet access charges of a wireless network operator.
19. A system according to claim 15 and wherein said information is utilized for subsidizing at least one of packets count charges and time charges.

20. A system according to claim 15 and wherein said Internet environment is an end-to-end secure Internet environment.

21. A system according to claim 15 and wherein said Internet environment is a non-end-to-end secure Internet environment.

22. A system according to claim 15 and also comprising a fraud prevention functionality which determines whether a user receiving a subsidy in respect of an interaction actually participated in that interaction.

23. A system according to claim 22 and wherein said fraud prevention functionality includes the following functionalities:

   classifying users receiving subsidies over a predetermined threshold as suspect users; and

   determining, by using information received from web sites, whether the suspect users actually participated in interactions in respect of which they were credited with a subsidy.

24. A system according to claim 15 and wherein said information relating to said interactions is automatically communicated to said data communicator from at least one of an Internet point of presence, a wireless-Internet gateway, a content/application provider wireless-Internet gateway, a firewall and a router located at either an ISP or a wireless network operator facility.
25. A system according to claim 15 and wherein said information relating to said interactions is employed to determine whether a given interaction is entitled to a subsidy.

26. A system according to claim 25 and wherein said information relating to said interactions is also employed to determine telephone numbers of users participating in said interactions to which subsidies are to be credited.

27. A system according to claim 15 and wherein said information is communicated to a processing module which is located at either an ISP or a wireless network operator facility and only part of said information is communicated from said processing module outside of either said ISP or a wireless network operator facility.

28. A system according to claim 27 and wherein information relating to the telephone numbers of users to which subsidies are to be credited is not communicated from said processing module outside of either said ISP or a wireless network operator facility.

29. In an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a methodology operative to subsidize Internet access costs in respect of interactions between at least one user and at least one web site, the methodology including:

   determining for which of said interactions, Internet access costs are subsidized; and

automatically indicating to said user via said device when Internet access costs are being subsidized.
30. A methodology according to claim 29 wherein wireless-Internet access costs are being subsidized.

31. A methodology according to claim 29 and wherein said automatically indicating comprises providing a visible icon overlaid on a web page.

32. A methodology according to claim 29 and wherein said determining includes at least one of:

   determining whether Internet access costs are subsidized according to the identity of a web page;

   determining whether Internet access costs are subsidized according to the identity of a user;

   determining whether Internet access costs are subsidized according to the identity of an ISP through which said interaction takes place;

   determining whether Internet access costs are subsidized according to the identity of a wireless network operator through which said interaction takes place; and

   determining whether Internet access costs are subsidized according to more than one of:

      the identity of a web page;

      the identity of a user;

      the identity of an ISP through which said interaction takes place;

      the identity of a wireless network operator through which said interaction takes place.

33. A methodology according to claim 29 and wherein said Internet environment is an end-to-end secure Internet environment.
34. A methodology according to claim 29 and wherein said Internet environment is a non-end-to-end secure Internet environment.

35. A methodology according to claim 29 and wherein said automatically indicating includes indicating the identity of the portal which referred said user to said web site.

36. In an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a system operative to subsidize Internet access costs in respect of interactions between at least one user and at least web site, the system including:

   a decision engine determining for which of said interactions, Internet access costs are subsidized; and

   an indicator generator automatically indicating to said user when Internet access costs are being subsidized.

37. A system according to claim 36 wherein wireless-Internet access costs are being subsidized.

38. A system according to claim 36 and wherein said indicator generator generates a visible icon overlaid on a web page.

39. A system according to claim 36 and wherein said decision engine is operative to provide at least one of the following functionalities:

   determining whether Internet access costs are subsidized according to the identity of a web page;

   determining whether Internet access costs are subsidized according to the identity of a user;
determining whether Internet access costs are subsidized according to the identity of an ISP through which said interaction takes place;

determining whether Internet access costs are subsidized according to the identity of a wireless network operator through which said interaction takes place; and

determining whether Internet access costs are subsidized according to more than one of:

the identity of a web page;

the identity of a user;

the identity of an ISP through which said interaction takes place;

the identity of a wireless network operator through which said interaction takes place.

40. A system according to claim 36 and wherein said Internet environment is an end-to-end secure Internet environment.

41. A system according to claim 36 and wherein said Internet environment is a non-end-to-end secure Internet environment.

42. A system according to claim 36 and wherein said indicator generator indicates the identity of the portal which referred said user to said web site.

43. In an Internet environment, wherein a first multiplicity of devices operated by a second multiplicity of users communicate via a third multiplicity of intermediaries with a forth multiplicity of sites on the Internet, a methodology for subsidizing Internet access costs in respect of interactions between at least one user and at least one web site, the methodology including:

automatically communicating information relating to a fifth multiplicity of transactions between users and web sites; and
operating a clearance center for receiving said information and supplying said information to at least one of the group consisting of: said second multiplicity of users, a sixth multiplicity of wireless ISPs, a seventh multiplicity of wireless network operators and an eighth multiplicity of content/application providers in order to subsidize Internet access costs in respect of interactions between at least one user and at least one web site.

44. A methodology according to claim 43 and wherein said Internet access costs include wireless-Internet access costs.

45. In an Internet environment, wherein a first multiplicity of devices operated by a second multiplicity of users communicate via a third multiplicity of intermediaries with a fourth multiplicity of sites on the Internet, a subsidizing engine operative to subsidize Internet access costs in respect of interactions between at least one user and at least one web site, the system including:

a) an information communication subsystem, automatically communicating information relating to a fifth multiplicity of transactions between users and web sites; and

b) a clearance center, receiving said information and supplying said information to at least one of the group consisting of: said second multiplicity of users, a sixth multiplicity of wireless ISPs, a seventh multiplicity of wireless network operators and an eighth multiplicity of content/application providers in order to subsidize Internet access costs in respect of interactions between at least one user and at least one web site.

46. A subsidizing engine according to claim 45 and wherein said Internet access costs include wireless-Internet access costs.

47. A methodology according to any of claims 1 - 14, 43 and 44 and wherein said subsidizing includes providing a subsidy for a subsidized web page notwithstanding that
the web page is displayed from a cache memory of one of said multiplicity of devices employed by a user.

48. A methodology according to claim 47 and wherein said providing employs an HTTP link on each said subsidized web page which is capable of being displayed from said cache memory.

49. A methodology according to claim 48 and wherein employing said HTTP link on each said subsidized web page which is capable of being displayed from said cache memory comprises:

- employing said link to cause a browser operated by said at least one user to request a phantom object from a phantom object generator;
- causing said phantom object generator, in response to said request, to download said phantom object to said browser; and
- employing said phantom object to generate a subsidy in respect of said subsidized web page.

50. A methodology according to claim 8 and wherein said fraud prevention functionality includes the following functionalities:

- classifying users receiving subsidies over a predetermined threshold as suspect users; and
- determining, by using information obtained by employing a phantom object, whether the suspect users actually participated in interactions in respect of which they were credited with a subsidy.

51. A methodology according to any of claims 1 - 14, 43 and 44 and wherein said subsidizing is carried out in at least near real time.
52. A methodology according to any of claims 1 - 14, 43 and 44 and wherein said subsidizing wireless-Internet access costs employs at least one of rated or un-rated information.

53. A methodology according to any of claims 1 - 14, 43 and 44 and wherein said subsidizing involves payment of a subsidy by an operator of said web site.

54. A methodology according to any of claims 1 - 14, 43 and 44 and wherein said subsidizing involves payment of a subsidy by an entity other than an operator of said web site.

55. A methodology according to any of claims 1 - 14, 43 and 44 and wherein said subsidizing is operative to cover access costs associated with access to an Intranet web site.

56. A methodology according to any of claims 1 - 14, 43 and 44 and wherein said subsidizing takes place in a mobile workforce environment and is operative to cover access costs associated with access to an employer Intranet web site by employees.

57. A methodology according to any of claims 1 - 14, 43 and 44 and wherein said subsidizing is operative to neutralize packet-based and time-based wireless access costs in a content-based billing environment.

58. A methodology according to any of claims 1 - 14, 43 and 44 and wherein said subsidizing is operative in a fixed price wireless-Internet access environment to subsidize wireless-Internet access costs based on a proportion of subsidized session parameters to non-subsidized session parameters.
59. A methodology according to any of claims 1 - 14, 43 and 44 and wherein said subsidizing is operative in a fixed price wireless-Internet access environment to subsidize wireless-Internet access costs such that the subsidy credited to a user cannot exceed the fixed price paid by the user.

60. A system according to any of claims 15 - 28, 45 and 46 and wherein said subsidizing engine provides a subsidy for a subsidized web page notwithstanding that the web page is displayed from a cache memory of one of said multiplicity of devices employed by a user.

61. A system according to claim 60 and wherein said subsidizing engine employs an HTTP link on each said subsidized web page which can be displayed from said cache memory.

62. A system according to claim 61 and wherein said HTTP link on each said subsidized web page which can be displayed from said cache memory is employed to cause a browser operated by said at least one user to request a phantom object from a phantom object generator, which, in response to said request, downloads said phantom object to said browser and said phantom object is employed to generate a subsidy in respect of said subsidized web page.

63. A system according to claim 22 and wherein said fraud prevention functionality includes the following functionalities:

   classifying users receiving subsidies over a predetermined threshold as suspect

   users; and

   determining, by using information obtained by employing a phantom object, whether the suspect users actually participated in interactions in respect of which they were credited with a subsidy.
64. A system according to any of claims 15 - 28, 45 and 46 and wherein said subsidizing engine at least partially operates in at least near real time.

65. A system according to any of claims 15 - 28, 45 and 46 and wherein said subsidizing engine employs at least one of rated or un-rated information.

66. A system according to any of claims 15 - 28, 45 and 46 and wherein said subsidizing engine employs payment of a subsidy by an operator of said web site.

67. A system according to any of claims 15 - 28, 45 and 46 and wherein said subsidizing engine employs payment of a subsidy by an entity other than an operator of said web site.

68. A system according to any of claims 15 - 28, 45 and 46 and wherein said subsidizing engine is operative to cover access costs associated with access to an Intranet web site.

69. A system according to any of claims 15 - 28, 45 and 46 and wherein said subsidizing engine operates in a mobile workforce environment and is operative to cover access costs associated with access to an employer Intranet web site by employees.

70. A system according to any of claims 15 - 28, 45 and 46 and wherein said subsidizing engine is operative to neutralize packet-based and time-based wireless access costs in a content-based billing environment.

71. A system according to any of claims 15 - 28, 45 and 46 and wherein said subsidizing engine is operative in a fixed price wireless-Internet access environment to
subsidize wireless-Internet access costs based on a proportion of subsidized session parameters to non-subsidized session parameters.

72. A system according to any of claims 15 - 28, 45 and 46 and wherein said subsidizing engine is operative in a fixed price wireless-Internet access environment to subsidize wireless-Internet access costs such that the subsidy credited to a user cannot exceed the fixed price paid by the user.

73. A methodology according to any of claims 1 - 14, 43, 44 and 47 - 57 and wherein said subsidizing comprises selectively subsidizing wireless-Internet access costs based on at least one of user status and user activity.

74. A methodology according to claim 73 and wherein said user status includes user entitlement status.

75. A methodology according to claim 73 or claim 74 and wherein said user activity includes completion of a commercial transaction by a user in the course of interaction between said user and said web site.

76. A methodology according to any of claims 73 - 75 and wherein said selectively subsidizing employs pages in said web site which are only accessible to selected users.

77. A methodology according to any of claims 1 - 14, 43, 44, 47 - 57 and 73 - 76 and wherein said subsidizing includes subsidizing less than the all of said Internet access costs.

78. A methodology according to claim 77 and wherein said subsidizing less than all of said Internet access costs comprises at least one of:
crediting a user at a crediting rate which is less than a charging rate at which said user is charged for said Internet access;

capping a credit to a user for a given interaction with a website;

capping total credit to a user for access to a given website over a given period of time.

79. A methodology according to any of claims 29, 30, 33 and 34 and wherein said automatically indicating comprises employing an HTTP link on said at least one website to display a subsidy-indicating icon to said at least one user.

80. A methodology according to claim 79 and wherein said employing comprises:

employing said link to cause a browser operated by said at least one user to request said subsidy-indicating icon from an icon generator; and

causing said icon generator, in response to said request, to download said icon to said browser.

81. A methodology according to claim 80 and wherein said icon generator is capable of downloading multiple different subsidy-indicating icons.

82. A methodology according to claim 81 and wherein said icon generator is capable of downloading a different subsidy-indicating icon for at least one of each different wireless operator/ISP, each different content/application provider and each different combination of wireless operator/ISP and content/application provider in a wireless-Internet environment.

83. A methodology according to any of claims 31 - 35 and 79 - 82 and wherein said icon appears on at least one of a subsidized web page and a menu page.
84. A system according to any of claims 15 - 28, 45 - 46, and 60 - 70 and wherein said subsidizing engine is operative for selectively subsidizing wireless-Internet access costs based on at least one of user status and user activity.

5 85. A system according to claim 84 and wherein said user status includes user entitlement status.

86. A system according to claim 84 or claim 85 and wherein said user activity includes completion of a commercial transaction by a user in the course of interaction between said user and said web site.

87. A system according to any of claims 84 - 86 and wherein said subsidizing engine employs pages in said web site which are only accessible to selected users.

88. A system according to any of claims 15 - 28, 45, 46, 60 - 70 and 84 - 87 and wherein said subsidizing engine is operative to subsidize less than the all of said Internet access costs.

89. A system according to claim 88 and wherein said subsidizing engine comprises at least one of:

   a rate based creditor, crediting a user at a crediting rate which is less than a charging rate at which said user is charged for said Internet access;

   a per-interaction capper, capping a credit to a user for a given interaction with a website; and

   a per-time duration capper, capping total credit to a user for access to a given website over a given period of time.
90. A system according to any of claims 36, 37, 40 and 41 and wherein said automatic indication generator employs an HTTP link on said at least one web site to display a subsidy-indicating icon to said at least one user.

91. A system according to claim 90 and wherein said automatic indication generator employs said link to cause a browser operated by said at least one user to request said subsidy-indicating icon from an icon generator and said icon generator, in response to said request, downloads said icon to said browser.

92. A system according to claim 91 and wherein said icon generator is capable of downloading multiple different subsidy-indicating icons.

93. A system according to claim 92 and wherein said icon generator is capable of downloading a different subsidy-indicating icon for at least one of each different wireless operator/ISP, each different content/application provider and each different combination of wireless operator/ISP and content/application provider in a wireless-Internet environment.

94. A system according to any of claims 38 - 42 and 90 - 93 and wherein said icon appears on at least one of a subsidized web page and a menu page.

95. In an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a methodology operative to provide commercial information regarding interactions between a user and a web site the methodology including:

   communicating from the web site at least one first session identifier, coupled with first data relative to at least one session identified by said at least one session identifier;

   communicating from said at least one intermediary at least one second session identifier, coupled with second data relative to said at least one session identified by
said at least one second session identifier; and

employing said at least one first and said at least one second session identifiers to correlate said first data with said second data.

96. A methodology according to claim 95 and wherein said at least one intermediary handles a number of sessions which greatly exceeds a number of sessions handled by said web site; and

only data for sessions identified by correlation of said at least one first and said at least one second session identifiers is received from said at least one intermediary.

97. A methodology according to claim 95 and wherein said second session identifier is employed for verifying participation of said intermediary in said at least one session.

98. A methodology according to claim 95 and wherein said multiplicity of devices communicate via at least one intermediary with sites on the Internet at least partially in a wireless manner.

99. A methodology according to claim 95 and wherein said at least one intermediary includes at least one element of the group consisting of: an Internet point of presence, a wireless-Internet gateway and a portal server.

100. A methodology according to claim 95 and wherein said first data at least partially relates to content communicated from said web site to said user.

101. A methodology according to claim 95 and wherein said first data is automatically generated by said web site on the basis of predetermined criteria.

102. A methodology according to claim 95 and wherein said first data is generated by said web site upon receiving the user’s request for an interaction with said web site.

103. A methodology according to claim 95 and wherein said at least one of said first
data, said second data, said first identifier and said second identifier is utilized for revenue sharing with said at least one intermediary.

104. A methodology according to claim 95 and wherein said at least one of said first data, said second data, said first identifier and said second identifier is utilized for billing by at least one intermediary for user's transactions with a web site.

105. A methodology according to claim 95 and wherein said at least one of said first data, said second data, said first identifier and said second identifier is utilized for content-based billing.

106. A methodology according to claim 95 and wherein said at least one of said first data, said second data, said first identifier and said second identifier is utilized for composite content-based billing.

107. A methodology according to claim 95 and wherein said at least one of said first data, said second data, said first identifier and said second identifier is utilized for subsidizing Internet access costs.

108. In an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a system operative to provide commercial information regarding interactions between a user and a web site the system including:

a web site data communicator communicating from the web site at least one first session identifier, coupled with first data relative to at least one session identified by said at least one first session identifier; and

da data correlator receiving from said at least one intermediary at least one second session identifier, coupled with at least one second data relative to said at least one session and employing said at least one first and said at least one second session identifiers to correlate said first data with said second data.
109. A system according to claim 108 and wherein said at least one intermediary handles a number of sessions which greatly exceeds a number of sessions handled by said web site; and

only data for sessions identified by correlation of said at least one first and said at least one second session identifiers is received from said at least one intermediary.

110. A system according to claim 108 and wherein said second session identifier is employed for verifying participation of said intermediary in said at least one session.

111. A system according to claim 108 and wherein said multiplicity of devices communicate via at least one intermediary with sites on the Internet at least partially in a wireless manner.

112. A system according to claim 108 and wherein said at least one intermediary includes at least one element of the group consisting of: an Internet point of presence, a wireless-Internet gateway and a portal server.

113. A system according to claim 108 and wherein said first data at least partially relates to content communicated from said web site to said user.

114. A system according to claim 108 and wherein said first data is automatically generated by said web site on the basis of predetermined criteria.

115. A system according to claim 108 and wherein said first data is generated by said web site upon receiving the user’s request for an interaction with said web site.

116. A system according to claim 108 and wherein said at least one of said first data, said second data, said first identifier and said second identifier is utilized for revenue sharing with said at least one intermediary.

117. A system according to claim 108 and wherein said at least one of said first data,
said second data, said first identifier and said second identifier is utilized for billing by at least one intermediary for user’s transactions with a web site.

118. A system according to claim 108 and wherein said at least one of said first data, said second data, said first identifier and said second identifier is utilized for content-based billing.

119. A system according to claim 108 and wherein said at least one of said first data, said second data, said first identifier and said second identifier is utilized for composite content-based billing.

120. A system according to claim 108 and wherein said at least one of said first data, said second data, said first identifier and said second identifier is utilized for subsidizing Internet access costs.

121. A system according to claim 108 and wherein said data correlator includes:

- at least one intermediary data module which receives from said at least one intermediary said at least one second session identifier, coupled with said second data and also receives said at least one first session identifier coupled with said first data and correlates said at least one first session identifier and said at least one second session identifier; and

- at least one service center which employs said correlated at least one first and at least one second session identifiers to correlate said first data with said second data.

122. A system according to claim 121 and wherein said at least one intermediary handles a number of sessions which greatly exceeds a number of sessions handled by said web site;

- only data for sessions identified by correlation of said at least one first and said at least one second session identifiers is received by said at least one service center from said at least one intermediary data module.
123. In an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a methodology operative to provide commercial information regarding interactions between a user and a web site the methodology including:

communicating information requested by the user from said web site to said user; and

separately from communicating information requested by the user from said web site to said user, communicating from the web site to a recipient other than the user at least one session identifier, coupled with data relative to a session identified by said at least one session identifier.

124. A methodology according to claim 123 and wherein said multiplicity of devices communicate via at least one intermediary with sites on the Internet at least partially in a wireless manner.

125. A methodology according to claim 123 and wherein said data at least partially relates to content communicated from said web site to said user.

126. A methodology according to claim 123 and wherein said data is automatically generated by said web site on the basis of predetermined criteria.

127. A methodology according to claim 123 and wherein said data is generated by said web site upon receiving the user’s request for an interaction with said web site.

128. A methodology according to claim 123 and wherein said at least one of said data, and said identifier is utilized for revenue sharing with said at least one intermediary.

129. A methodology according to claim 123 and wherein said at least one of said data, and said identifier is utilized for billing by at least one intermediary for user’s transactions with a web site.
130. A methodology according to claim 123 and wherein said at least one of said data, and said identifier is utilized for content-based billing.

131. A methodology according to claim 123 and wherein said at least one of said data, and said identifier is utilized for composite content-based billing.

132. A methodology according to claim 123 and wherein said at least one of said data, and said identifier is utilized for subsidizing Internet access costs.

133. In an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a system operative to provide commercial information regarding interactions between a user and a web site, the system including:
   a web site-user data communicator communicating information requested by the user from said web site to said user; and
   a web site- non user data communicator, communicating from said web site to a recipient other than said user at least one session identifier, coupled with data relative to a session identified by said at least one session identifier.

134. A system according to claim 133 and wherein said multiplicity of devices communicate via at least one intermediary with sites on the Internet at least partially in a wireless manner.

135. A system according to claim 133 and wherein said data relative to a session at least partially relates to content communicated from said web site to said user.

136. A system according to claim 133 and wherein said data relative to a session is automatically generated by said web site on the basis of predetermined criteria.

137. A system according to claim 133 and wherein said data relative to a session is
generated by said web site upon receiving the user’s request for an interaction with said web site.

138. A system according to claim 133 and wherein said at least one of said data relative to a session, and said identifier is utilized for revenue sharing with said at least one intermediary.

139. A system according to claim 133 and wherein said at least one of said data relative to a session, and said identifier is utilized for billing by at least one intermediary for user’s transactions with a web site.

140. A system according to claim 133 and wherein said at least one of said data relative to a session, and said identifier is utilized for content-based billing.

141. A system according to claim 133 and wherein said at least one of said data relative to a session, and said identifier is utilized for composite content-based billing.

142. A system according to claim 133 and wherein said at least one of said data relative to a session, and said identifier is utilized for subsidizing Internet access costs.

143. In an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a methodology operative to provide commercial information regarding interactions between a user and a web site the methodology including:

   communicating from said at least one intermediary, at least one session identifier; and
   
   employing said session identifier for verifying participation of said intermediary in a session between said user and said web site.

144. In an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a system operative to provide
commercial information regarding interactions between a user and a web site the system including:

an intermediary data communicator communicating from at least one intermediary at least one session identifier and employing said session identifier for verifying participation of said intermediary in a session between said user and said web site.

145. In an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a methodology operative to provide commercial information regarding interactions between a user and a web site the methodology including:

communicating information requested by the user from said web site to said user; and

separately from communicating information requested by the user from said web site to said user, automatically generating at said web site data at least partially relating to said information communicated from said web site to said user.

146. A methodology according to claim 145 and wherein said multiplicity of devices communicate via at least one intermediary with sites on the Internet at least partially in a wireless manner.

147. A methodology according to claim 145 and wherein said at least one intermediary includes at least one element of the group consisting of: an Internet point of presence, a wireless-Internet gateway and a portal server.

148. A methodology according to claim 145 and wherein said data at least partially relates to content communicated from said web site to said user.

149. A methodology according to claim 145 and wherein said data is automatically generated by said web site on the basis of predetermined criteria.
150. A methodology according to claim 145 and wherein said data is generated by said web site upon receiving the user's request for an interaction with said web site.

151. A methodology according to claim 145 and wherein said data is utilized for revenue sharing with said at least one intermediary.

152. A methodology according to claim 145 and wherein said data is utilized for billing by at least one intermediary for user's transactions with a web site.

153. A methodology according to claim 145 and wherein said data is utilized for content-based billing.

154. A methodology according to claim 145 and wherein said data is utilized for composite content-based billing.

155. A methodology according to claim 145 and wherein said data is utilized for subsidizing Internet access costs.

156. In an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a system operative to provide commercial information regarding interactions between a user and a web site, the system including:

   a web site-user data communicator communicating information requested by the user from said web site to said user; and

   a web site data generator automatically generating data at least partially relating to said information communicated from said web site to said user.

157. A system according to claim 156 and wherein said multiplicity of devices communicate via at least one intermediary with sites on the Internet at least partially in a wireless manner.
158. A system according to claim 156 and wherein said at least one intermediary includes at least one element of the group consisting of: an Internet point of presence, a wireless-Internet gateway and a portal server.

159. A system according to claim 156 and wherein said data at least partially relates to content communicated from said web site to said user.

160. A system according to claim 156 and wherein said data is automatically generated by said web site on the basis of predetermined criteria.

161. A system according to claim 156 and wherein said data is generated by said web site upon receiving the user’s request for an interaction with said web site.

162. A system according to claim 156 and wherein said at least one of said data is utilized for revenue sharing with said at least one intermediary.

163. A system according to claim 156 and wherein said at least one of said data is utilized for billing by at least one intermediary for user’s transactions with a web site.

164. A system according to claim 156 and wherein said at least one of said data is utilized for content-based billing.

165. A system according to claim 156 and wherein said at least one of said data is utilized for composite content-based billing.

166. A system according to claim 156 and wherein said at least one of said data is utilized for subsidizing Internet access costs.

167. In an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a system operative to provide commercial information regarding interactions between a user and a web site the system
including:

a content server data module communicating from the web site at least one first session identifier, coupled with first data relative to at least one session identified by said at least one first session identifier; and

an intermediary data module communicating from said at least one intermediary at least one second session identifier, coupled with second data relative to said at least one session and employing said at least one first and said at least one second session identifiers to enable correlation of said first data with said second data.

168. A system according to claim 167 and wherein said at least one intermediary handles a number of sessions which greatly exceeds a number of sessions handled by said web site; and

only data for sessions identified by correlation of said at least one first and said at least one second session identifiers is received from said at least one intermediary.

169. A system according to claim 167 and wherein said second session identifier is employed for verifying participation of said intermediary in said at least one session.

170. A system according to claim 167 and wherein said multiplicity of devices communicate via at least one intermediary with sites on the Internet at least partially in a wireless manner.

171. A system according to claim 167 and wherein said at least one intermediary includes at least one element of the group consisting of: an Internet point of presence, a wireless-Internet gateway and a portal server.

172. A system according to claim 167 and wherein said first data at least partially relates to content communicated from said web site to said user.

173. A system according to claim 167 and wherein said first data is automatically generated by said web site on the basis of predetermined criteria.
174. A system according to claim 167 and wherein said first data is generated by said web site upon receiving the user's request for an interaction with said web site.

175. A system according to claim 167 and wherein said at least one of said first data, said second data, said first identifier and said second identifier is utilized for revenue sharing with said at least one intermediary.

176. A system according to claim 167 and wherein said at least one of said first data, said second data, said first identifier and said second identifier is utilized for billing by at least one intermediary for user's transactions with a web site.

177. A system according to claim 167 and wherein said at least one of said first data, said second data, said first identifier and said second identifier is utilized for content-based billing.

178. A system according to claim 167 and wherein said at least one of said first data, said second data, said first identifier and said second identifier is utilized for composite content-based billing.

179. A system according to claim 167 and wherein said at least one of said first data, said second data, said first identifier and said second identifier is utilized for subsidizing Internet access costs.

180. In an Internet environment, wherein a multiplicity of devices communicate via an Internet point of presence with sites on the Internet, a methodology operative to provide commercial information regarding interactions between a user and a web site the methodology including:

communicating from the web site at least one first session identifier, coupled with first data relative to at least one session identified by said at least one first session identifier;
communicating from said Internet point of presence at least one second session identifier, coupled with second data relative to said at least one session identified by said at least one second session identifier; and

employing said at least one first and said at least one second session identifiers to correlate said first data with said second data.

181. A methodology according to claim 180 and wherein said Internet point of presence handles a number of sessions which greatly exceeds a number of sessions handled by said web site; and

only data for sessions identified by correlation of said at least one first and said at least one second session identifiers is received from said Internet point of presence.

182. A methodology according to claim 180 and wherein said second session identifier is employed for verifying participation of said Internet point of presence in said at least one session.

183. A methodology according to claim 180 and wherein said multiplicity of devices communicate via said Internet point of presence with sites on the Internet at least partially in a wireless manner.

184. In an Internet environment, wherein a multiplicity of devices communicate via an Internet point of presence with sites on the Internet, a system operative to provide commercial information regarding interactions between a user and a web site the system including:

a web site data communicator communicating from the web site at least one first session identifier, coupled with first data relative to at least one session identified by said at least one session identifier; and

a data correlator receiving from said Internet point of presence at least one second session identifier, coupled with at least one second data relative to said at least one session and employing said at least one first and said at least one second session identifiers to correlate said first data with said second data.
185. A system according to claim 184 and wherein said data correlator includes:

at least one Internet point of presence data module which receives from said
Internet point of presence said at least one second session identifier, coupled with said
second data and also receives said at least one first session identifier coupled with said
first data and correlates said at least one first session identifier and said at least one
second session identifier; and

at least one service center which employs said correlated at least one first and at
least one second session identifiers to correlate said first data with said second data.

186. A system according to claim 185 and wherein said Internet point of presence
handles a number of sessions which greatly exceeds a number of sessions handled by
said web site;

only data for sessions identified by correlation of said at least one first and said
at least one second session identifiers is received by said at least one service center from
said Internet point of presence data module.

187. In an Internet environment, wherein a multiplicity of devices communicate via
an Internet point of presence with sites on the Internet, a methodology operative to
provide commercial information regarding interactions between a user and a web site
the methodology including:

communicating information requested by the user from said web site to said
user; and

separately from communicating information requested by the user from said web
site to said user, communicating from the web site to a recipient other than the user at
least one session identifier, coupled with data relative to a session identified by said at
least one session identifier.

188. In an Internet environment, wherein a multiplicity of devices communicate via
an Internet point of presence with sites on the Internet, a system operative to provide
commercial information regarding interactions between a user and a web site, the
system including:

- a web site- user data communicator communicating information requested by the
  user from said web site to said user; and
- a web site- non user data communicator, communicating from said web site to a
  recipient other than the user at least one session identifier, coupled with data relative to
  a session identified by said at least one session identifier.

189. In an Internet environment, wherein a multiplicity of devices communicate via
an Internet point of presence with sites on the Internet, a system operative to provide
commercial information regarding interactions between a user and a web site the system
including:

- a content server data module communicating from the web site at least one first
  session identifier, coupled with first data relative to at least one session identified by
  said at least one first session identifier; and
- an Internet point of presence data module communicating from said Internet
  point of presence at least one second session identifier, coupled with second data
  relative to said at least one session and employing said at least one first and said at least
  one second session identifiers to enable correlation of said first data with said second
  data.

190. In an Internet environment, wherein a multiplicity of devices communicate via a
wireless-Internet gateway with sites on the Internet, a methodology operative to provide
commercial information regarding interactions between a user and a web site the
methodology including:

- communicating from the web site at least one first session identifier, coupled
  with first data relative to at least one session identified by said at least one first session
  identifier;
- communicating from said wireless-Internet gateway at least one second session
  identifier, coupled with second data relative to said at least one session identified by
  said at least one second session identifier; and
- employing said at least one first and said at least one second session identifiers
to correlate said first data with said second data.

191. A methodology according to claim 190 and wherein said wireless-Internet gateway handles a number of sessions which greatly exceeds a number of sessions handled by said web site; and
only data for sessions identified by correlation of said at least one first and said at least one second session identifiers is received from said wireless-Internet gateway.

192. A methodology according to claim 190 and wherein said second session identifier is employed for verifying participation of said wireless-Internet gateway in said at least one session.

193. A methodology according to claim 190 and wherein said multiplicity of devices communicate via said wireless-Internet gateway with sites on the Internet at least partially in a wireless manner.

194. In an Internet environment, wherein a multiplicity of devices communicate via a wireless-Internet gateway with sites on the Internet, a system operative to provide commercial information regarding interactions between a user and a web site the system including:
a web site data communicator communicating from the web site at least one first session identifier, coupled with first data relative to at least one session identified by said at least one session identifier; and
a data correlator receiving from said wireless-Internet gateway at least one second session identifier, coupled with at least one second data relative to said at least one session and employing said at least one first and said at least one second session identifiers to correlate said first data with said second data.

195. A system according to claim 194 and wherein said data correlator includes:
at least one wireless-Internet gateway data module which receives from said wireless-Internet gateway said at least one second session identifier, coupled with said
second data and also receives said at least one first session identifier coupled with said first data and correlates said at least one first session identifier and said at least one second session identifier; and at least one service center which employs said correlated at least one first and at least one second session identifiers to correlate said first data with said second data.

196. A system according to claim 195 and wherein said wireless-Internet gateway handles a number of sessions which greatly exceeds a number of sessions handled by said web site; only data for sessions identified by correlation of said at least one first and said at least one second session identifiers is received by said at least one service center from said wireless-Internet gateway data module.

197. In an Internet environment, wherein a multiplicity of devices communicate via a wireless-Internet gateway with sites on the Internet, a methodology operative to provide commercial information regarding interactions between a user and a web site the methodology including: communicating information requested by the user from said web site to said user; and separately from communicating information requested by the user from said web site to said user, communicating from the web site to a recipient other than the user at least one session identifier, coupled with data relative to a session identified by said at least one session identifier.

198. In an Internet environment, wherein a multiplicity of devices communicate via a wireless-Internet gateway with sites on the Internet, a system operative to provide commercial information regarding interactions between a user and a web site, the system including: a web site- user data communicator communicating information requested by the user from said web site to said user; and a web site- non user data communicator, communicating from said web site to a
recipient other than the user at least one session identifier, coupled with data relative to a session identified by said at least one session identifier.

199. In an Internet environment, wherein a multiplicity of devices communicate via a wireless-Internet gateway with sites on the Internet, a system operative to provide commercial information regarding interactions between a user and a web site the system including:

   a content server data module communicating from the web site at least one first session identifier, coupled with first data relative to at least one session identified by said at least one first session identifier; and

   a wireless-Internet gateway data module communicating from said wireless-Internet gateway at least one second session identifier, coupled with second data relative to said at least one session and employing said at least one first and said at least one second session identifiers to enable correlation of said first data with said second data.

200. In an Internet environment, wherein a multiplicity of devices communicate with sites on the Internet, a methodology operative to provide commercial information regarding interactions between a user and a web site, said interactions being initiated by a link from a portal server, the methodology including:

   communicating from the web site at least one first session identifier, coupled with first data relative to at least one session identified by said at least one first session identifier;

   communicating from said portal server at least one second session identifier, coupled with second data relative to said at least one session identified by said at least one second session identifier; and

   employing said at least one first and said at least one second session identifiers to correlate said first data with said second data.

201. A methodology according to claim 200 and wherein said portal server handles a number of sessions which greatly exceeds a number of sessions handled by said web site; and
only data for sessions identified by correlation of said at least one first and said at least one second session identifiers is received from said portal server.

202. A methodology according to claim 200 and wherein said second session identifier is employed for verifying participation of said portal server in said at least one session.

203. A methodology according to claim 200 and wherein said multiplicity of devices communicate with sites on the Internet at least partially in a wireless manner.

204. In an Internet environment, wherein a multiplicity of devices communicate with sites on the Internet, a system operative to provide commercial information regarding interactions between a user and a web site, said interactions being initiated by a link from a portal server, the system including:

a web site data communicator communicating from the web site at least one first session identifier, coupled with first data relative to at least one session identified by said at least one session identifier; and

a data correlator receiving from said portal server at least one second session identifier, coupled with at least one second data relative to said at least one session and employing said at least one first and said at least one second session identifiers to correlate said first data with said second data.

205. A system according to claim 204 and wherein said data correlator includes:

at least one portal server data module which receives from said portal server said at least one second session identifier, coupled with said second data and also receives said at least one first session identifier coupled with said first data and correlates said at least one first session identifier and said at least one second session identifier; and

at least one service center which employs said correlated at least one first and at least one second session identifiers to correlate said first data with said second data.

206. A system according to claim 205 and wherein said portal server handles a
number of sessions which greatly exceeds a number of sessions handled by said web site;

only data for sessions identified by correlation of said at least one first and said at least one second session identifiers is received by said at least one service center from said portal server data module.

207. In an Internet environment, wherein a multiplicity of devices communicate with sites on the Internet, a methodology operative to provide commercial information regarding interactions between a user and a web site, said interactions being initiated by a link from a portal server, the methodology including:

communicating information requested by the user from said web site to said user; and

separately from communicating information requested by the user from said web site to said user, communicating from said web site to a recipient other than the user at least one session identifier, coupled with data relative to a session identified by said at least one session identifier.

208. In an Internet environment, wherein a multiplicity of devices communicate with sites on the Internet, a system operative to provide commercial information regarding interactions between a user and a web site, said interactions being initiated by a link from a portal server, the system including:

a web site-user data communicator communicating information requested by the user from said web site to said user; and

a web site-non user data communicator, communicating from said web site to a recipient other than the user at least one session identifier, coupled with data relative to a session identified by said at least one session identifier.

209. In an Internet environment, wherein a multiplicity of devices communicate with sites on the Internet, a system operative to provide commercial information regarding interactions between a user and a web site, said interactions being initiated by a link from a portal server, the system including:
a content server data module communicating from the web site at least one first session identifier, coupled with first data relative to at least one session identified by said at least one first session identifier; and

a portal server data module communicating from said portal server at least one second session identifier, coupled with second data relative to said at least one session and employing said at least one first and said at least one second session identifiers to enable correlation of said first data with said second data.

210. In an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a methodology operative to provide revenue sharing with said at least one intermediary in respect of interactions between a user and a web site the methodology including:

automatically communicating from the web site to at least one recipient other than said user information relating to said interactions between a user and a web site;

and

utilizing said information for revenue sharing.

211. A methodology according to claim 210 and also including:

automatically communicating additional information from said at least one intermediary in respect of said interactions; and

utilizing said additional information for revenue sharing.

212. In an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a system operative to provide revenue sharing with said at least one intermediary in respect of interactions between a user and a web site, the system including:

a web site data communicator automatically communicating from the web site to at least one recipient other than said user information relating to said interactions between a user and a web site; and

a revenue sharing engine utilizing said information for revenue sharing.
213. A system according to claim 212 and also including:

an intermediary communicator automatically communicating additional
information from said at least one intermediary in respect of said interactions; and

wherein

said revenue sharing engine also utilizes said additional information for revenue
sharing.

214. In an Internet environment, wherein a multiplicity of devices communicate via at
least one intermediary with sites on the Internet, a methodology operative to provide
billing by an intermediary for transactions with a web site, the methodology including:

automatically communicating from the web site to at least one recipient other
than said user information relating to said transactions between a user and a web site;
and

utilizing said information for billing by an intermediary for transactions with a
web site.

215. A methodology according to claim 214 and also including:

automatically communicating additional information from said at least one
intermediary in respect of said transactions; and

utilizing said additional information for billing by an intermediary for
transactions with a web site.

216. In an Internet environment, wherein a multiplicity of devices communicate via at
least one intermediary with sites on the Internet, a system operative to provide billing by
an intermediary for transactions with a web site, the system including:

a web site data communicator automatically communicating from the web site to
at least one recipient other than said user information relating to said transactions
between a user and a web site; and

a billing by an intermediary engine utilizing said information for billing by an
intermediary for transactions with a web site.
217. A system according to claim 216 and also including:
   an intermediary communicator automatically communicating additional
   information from said at least one intermediary in respect of said transactions; and
   wherein
   said billing by an intermediary engine also utilizes said additional information
   for billing by an intermediary for transactions with a web site.

218. In an Internet environment, wherein a multiplicity of devices communicate via at
   least one intermediary with sites on the Internet, a methodology operative to provide
   revenue sharing with said at least one intermediary in respect of interactions between a
   user and a web site the methodology including:
   automatically communicating from the web site to at least one recipient other
   than said user information relating to said interactions between a user and a web site;
   and
   utilizing said information for revenue sharing with a wireless network operator.

219. A methodology according to claim 218 and also including:
   automatically communicating additional information from said at least one
   intermediary in respect of said interactions; and
   utilizing said additional information for revenue sharing with said wireless
   network operator.

220. In an Internet environment, wherein a multiplicity of devices communicate via at
   least one intermediary with sites on the Internet, a system operative to provide revenue
   sharing with said at least one intermediary in respect of interactions between a user and
   a web site, the system including:
   a web site data communicator automatically communicating from the web site to
   at least one recipient other than said user information relating to said interactions
   between a user and a web site; and
   a revenue sharing engine utilizing said information for revenue sharing with a
   wireless network operator.
221. A system according to claim 220 and also including:

an intermediary communicator automatically communicating additional information from said at least one intermediary in respect of said interactions; and

wherein

said revenue sharing engine also utilizes said additional information for revenue sharing with said wireless network operator.

222. In an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a methodology operative to provide billing by an intermediary for transactions with a web site, the methodology including:

automatically communicating from the web site to at least one recipient other than said user information relating to said transactions between a user and a web site; and

utilizing said information for billing by a wireless network operator for transactions with a web site.

223. A methodology according to claim 222 and also including:

automatically communicating additional information from said at least one intermediary in respect of said transactions; and

utilizing said additional information for billing by said wireless network operator for transactions with a web site.

224. In an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a system operative to provide billing by an intermediary for transactions with a web site, the system including:

a web site data communicator automatically communicating from the web site to at least one recipient other than said user information relating to said transactions between a user and a web site; and

a billing by an intermediary engine utilizing said information for billing by a wireless network operator for transactions with a web site.
225. A system according to claim 224 and also including:

an intermediary communicator automatically communicating additional information from said at least one intermediary in respect of said transactions; and

wherein

said billing by an intermediary engine also utilizes said additional information for billing by said wireless network operator for transactions with a web site.

226. In an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a methodology operative to provide content-based billing in respect of interactions between a user and a web site the methodology including:

automatically communicating from the web site to at least one recipient other than said user information relating to said interactions between a user and a web site;

and

utilizing said information for content-based billing.

227. A methodology according to claim 226 and also including:

automatically communicating additional information from said at least one intermediary in respect of said interactions; and

utilizing said additional information for content-based billing.

228. In an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a system operative to provide content-based billing in respect of interactions between a user and a web site, the system including:

a web site data communicator automatically communicating from the web site to at least one recipient other than said user information relating to said interactions between a user and a web site; and

a content-based billing engine utilizing said information for content-based billing.
229. A system according to claim 228 and also including:
an intermediary communicator automatically communicating additional information from said at least one intermediary in respect of said interactions; and wherein

said content-based billing engine also utilizes said additional information for content-based billing.

230. In an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a methodology operative to provide composite content-based billing in respect of interactions between a user and a web site the methodology including:

automatically communicating from the web site to at least one recipient other than said user information relating to said interactions between a user and a web site;

and

utilizing said information for composite content-based billing.

231. A methodology according to claim 230 and also including:

automatically communicating additional information from said at least one intermediary in respect of said interactions; and

utilizing said additional information for composite content-based billing.

232. In an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a system operative to provide composite content-based billing in respect of interactions between a user and a web site, the system including:

a web site data communicator automatically communicating from the web site to at least one recipient other than said user information relating to said interactions between a user and a web site; and

a composite content-based billing engine utilizing said information for composite content-based billing.
233. A system according to claim 232 and also including:

an intermediary communicator automatically communicating additional
information from said at least one intermediary in respect of said interactions; and

wherein

said composite content-based billing engine also utilizes said additional
information for composite content-based billing.

234. In an Internet environment, wherein a multiplicity of devices communicate via at
least one intermediary with sites on the Internet, a methodology operative to subsidize
Internet access costs in respect of interactions between a user and a web site, the
methodology including:

automatically communicating from the web site to at least one recipient other
than said user information relating to said interactions between a user and a web site;

and

utilizing said information for wireless-Internet access costs.

235. A methodology according to claim 234 and also including:

automatically communicating additional information from said at least one
intermediary in respect of said interactions; and

utilizing said additional information for subsidizing Internet access costs.

236. A methodology according to claim 234 and wherein said web site subsidizes
user Internet access charges of an ISP.

237. A methodology according to claim 234 and wherein said web site subsidizes
user wireless-Internet access charges of a wireless network operator.

238. A methodology according to claim 234 and wherein said information is utilized
for subsidizing at least one of packet count charges and time charges.
239. In an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a system operative to subsidize Internet access costs in respect of interactions between a user and a web site, the system including:

a web site data communicator automatically communicating from the web site to at least one recipient other than said user information relating to said interactions between a user and a web site; and

a subsidizing engine utilizing said information for subsidizing Internet access costs.

240. A system according to claim 239 and also including:

an intermediary communicator automatically communicating additional information from said at least one intermediary in respect of said interactions; and wherein

said subsidizing engine also utilizes said additional information for subsidizing Internet access costs.

241. A system according to claim 239 and wherein said web site subsidizes user wireless-Internet access charges of a wireless network operator.

242. A system according to claim 239 and wherein said information is utilized for subsidizing at least one of packet count charges and time charges.

243. In an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a methodology operative to subsidize Internet access costs in respect of interactions between at least one user and at least one web site, the methodology including:

determining for which of said interactions, Internet access costs are subsidized; and

automatically indicating to said user via said device when Internet access costs are being subsidized.
244. A methodology according to claim 243 wherein wireless-Internet access costs are being subsidized.

245. In an Internet environment, wherein a multiplicity of devices communicate via at least one intermediary with sites on the Internet, a system operative to subsidize Internet access costs in respect of interactions between at least one user and at least one web site, the system including:

   a decision engine determining for which of said interactions, Internet access costs are subsidized; and

   an indicator generator automatically indicating to said user via said device when Internet access costs are being subsidized.

246. A system according to claim 245 wherein wireless-Internet access costs are being subsidized.

247. In an Internet environment, wherein a first multiplicity of devices communicate via a second multiplicity of intermediaries with third multiplicity of sites on the Internet, a methodology operative to provide commercial information regarding interactions between users and web sites, the methodology including:

   automatically communicating at least from some of the third multiplicity of sites, information relating to a fourth multiplicity of transactions between users and web sites; and

   supplying said information to at least one of the group consisting of: said users, said second multiplicity of intermediaries and said third multiplicity of sites.

248. In an Internet environment, wherein a first multiplicity of devices communicate via a second multiplicity of intermediaries with third multiplicity of sites on the Internet, a system operative to provide commercial information regarding interactions between users and web sites, the system including:

   a web site information communication subsystem, automatically communicating
at least from some of the third multiplicity of sites, information relating to a fourth multiplicity of transactions between users and web sites; and

a clearance center, receiving said information and supplying said information to at least one of the group consisting of: said users, said second multiplicity of intermediaries and said third multiplicity of sites.
FIG. 10A

A SESSION BETWEEN A CONTENT/APPLICATION SERVER AND A USER IS COMMENCED

THE CSDM RECEIVES THE REQUESTED URL ID AND THE USER CATEGORY

IS THE USER ENTITLED TO WI-800 SUBSIDY FOR THE URL?

NO

YES

PROMPTLY SEND A SUBSIDIZED SESSION NOTIFICATION TO THE CONTENT/APPLICATION SERVER

SAVE URL ID AND CSDM/SCMD

HAS A PREDETERMINED PERIOD ELAPSED BEFORE A NEW WI-800 SESSION WITH SAME USER COMMENCED?

NO

YES

PREPARE A "SUBSIDIZES SESSION SERIE REPORT"

PERIODICALLY SEND REPORTS TO SERVICE CENTER
FIG. 10B

THE GWDM RECEIVES A GWDM/IR

THE GWDM SCANS DATABASE FOR CORRELATING THE GWDM/IR

A MATCH FOUND?

NO

MARK THE GWDM/IR AS "UNCORRELATED"

YES

PREPARE A REPORT

PERIODICALLY SEND REPORTS TO SERVICE CENTER
FIG. 10C

THE PPDM RECEIVES A PPDM/IR

THE PPDM SCANS DATABASE FOR CORRELATING THE PPDM/IR

A MATCH FOUND?

NO: MARK THE PPDM/IR AS "UNCORRELATED"

YES:

PREPARE A REPORT

PERIODICALLY SEND REPORTS TO SERVICE CENTER
The service center receives a "subsidized session series report" from a CSDM.

Are user's telephone number and POP ID included in the report?

Yes → The service center sends a GWDM/IR to an appropriate GWDM.

The service center receives the GWDM's response.

Is the GWDM/IR correlated?

No → The service center receives the GWDM's response.

Yes → Are user's telephone number and POP ID included in the correlated data?

No → Correlated data is stored at the service center for further processing by the SC billing/clearing subsystem.

Yes → Correlated data is stored at the service center for further processing by the SC billing/clearing subsystem.

To FIG. 10F To FIG. 10E
THE SERVICE CENTER SENDS A PPDM/IR TO AN APPROPRIATE PPDM

THE SERVICE CENTER RECEIVES THE PPDM'S RESPONSE

IS THE PPDM/IR CORRELATED?

NO

ARE THE MISSING USER TELEPHONE NUMBER OR POP ID INCLUDED IN THE CORRELATED DATA?

NO

YES

CORRELATED DATA IS STORED AT THE SERVICE CENTER FOR FURTHER PROCESSING BY THE SC BILLING/CLEARNING SUBSYSTEM

TO FIG. 10F

FAILURE TO EFFECT SUBSIDY

FIG. 10E
FIG. 10F

PERIODICALLY THE SERVICE CENTER PREPARES SSS SDRS

PERIODICALLY THE SC BILLING/CLEARING SUBSYSTEM PROCESSES SSS SDRS FOR GENERATING DEBIT/CREDIT REPORTS

PERIODICALLY THE SERVICE CENTER SENDS DEBIT REPORTS TO CONTENT/APPLICATION PROVIDERS AND CREDIT REPORTS TO WIRELESS NETWORK OPERATORS
FIG. 20A

WOIPM RECEIVES GW/SCMD

DOES THE GW/SCMD CONTAIN URL DATA?

Y

DOES THE URL QUALIFY FOR A WI-800 SUBSIDY?

N

Y

CORRELATE THE GW/SCMD WITH PP/SCMD AND PREPARE A GWSDR

TO FIG. 20C
**FIG. 20B**

- **WOIPM RECEIVES RT/SCMD**
  - \(\text{DOES THE DESTINATION IP ADDRESS QUALIFY FOR A WI-800 SUBSIDY?} \)
  - **Y**
    - **CORRELATE THE RT/SCMD WITH FW/SCMD**
    - **CORRELATE THE CORRELATED RT/SCMD AND FW/SCMD WITH PP/SCMD AND PREPARE A RTSDR**
    - **TO FIG. 20C**
  - **N**
FIG. 20C

FROM FIG. 20A

CORRELATE GWSDRS WITH RTSDRS

FROM FIG. 20B

PREPARE SSS SDRS

FROM FIG. 25B

IS THE SSS SDR ASSOCIATED WITH A PRE-PAID SUBSCRIBER?

Y

SEND THE SSS SDR TO THE CCBS IN NEAR REAL TIME

N

PERIODICALLY SEND SSS SDRS TO THE CCBS

PERIODICALLY SEND SSS SDR REPORTS TO THE SERVICE CENTER
FIG. 21

SC RECEIVES
SSS SDR REPORTS
FROM WOIPMS

PERIODICALLY THE SC
PROCESSES SSS SDRS FOR
GENERATING DEBIT REPORTS

PERIODICALLY THE SC SENDS
DEBIT REPORTS TO
CONTENT/APPLICATION PROVIDERS
FIG. 22

A SESSION BETWEEN A CONTENT/APPLICATION SERVER AND A USER IS COMMENCED

THE ICON GENERATOR RECEIVES DATA ITEMS CC., DD. AND GG.

ARE DATA ITEMS CC. AND DD. LISTED FOR WI-800 SUBSIDY?

Y

IS ITEM GG. LISTED FOR A SPECIAL ICON?

Y

ACTIVATE A SPECIAL WI-800 ICON FOR THE ENTIRE SUBSIDIZED SESSION SERIES

N

ACTIVATE THE STANDARD WI-800 ICON

N

Y
FIG. 23

FRAUD MONITOR RECEIVES FM/SCMD

ARE DATA ITEMS CC. AND DD. LISTED FOR WI-800 SUBSIDY?

Y

SAVE THE FM/SCMD FOR A PREDETERMINED PERIOD

FRAUD MONITOR RECEIVES A FM/IR

FRAUD MONITOR SENDS REQUESTED FM/SCMD TO SERVICE CENTER

N
SC RECEIVES FM/SCMD FROM THE FRAUD MONITOR

SC CORRELATES FM/SCMD WITH "SUSPECTED" SSS SDRS

A MATCH FOUND?

Y

MARK SSS SDR AS "NOT FRAUDULENT"

N

MARK SSS SDR AS "FRAUDULENT"

PERIODICALLY PREPARE "FRAUDULENT" SSS SDR CORRECTION REPORTS

PERIODICALLY SEND CORRECTION REPORTS TO WIRELESS NETWORK OPERATORS/WIRELESS ISPS AND CONTENT/APPLICATION PROVIDERS
FIG. 25A

RECEIVE CPGW/SCMD FROM CPGW COLLECTORS

SORT CPGW/SCMD BY OPERATOR/ISP

SEND CPGW/SCMD TO CORRESPONDING WOIPMS

TO FIG. 25B
FIG. 25B

FROM FIG. 25A

DOES THE URL IN A CPGW/SCMD QUALIFY FOR WI-800 SUBSIDY?

N

Y

CORRELATE THE CPGW/SCMD WITH PP/SCMD, FW/SCMD AND RT/SCMD AND PREPARE SDRS

PREPARE SSS SDRS

TO FIG 20C
FIG. 26

ICON GENERATOR RECEIVES DATA ITEMS SS, TT, AND UU AS PART OF AN HTTP REQUEST

ICON GENERATOR IDENTIFIES THE PARTICIPATING OPERATOR/ISP AND CONTENT/APPLICATION PROVIDER

ARE THE OPERATOR/ISP AND THE CONTENT/APPLICATION PROVIDER IN A WI-800 AGREEMENT?

Y
DOWNLOAD A WI-800 ICON

N
DOWNLOAD A BLANK ICON
SEND AN INTERROGATION REQUEST TO WOIPM

RECEIVE "POG GENERATED" GW/SCMD AND CPGW/SCMD DATA FROM THE WOIPM

CORRELATE THE DATA WITH "SUSPECTED" SSS SDRS

A MATCH FOUND?

Y

MARK SSS SDR AS "NOT FRAUDULENT"

N

MARK SSS SDR AS "FRAUDULENT"

PERIODICALLY PREPARE "FRAUDULENT" SSS SDR CORRECTION REPORTS

PERIODICALLY SEND CORRECTION REPORTS TO WIRELESS NETWORK OPERATORS/WIRELESS ISPS AND CONTENT/APPLICATION PROVIDERS
FIG. 29

ARE THE URLs VISITED LISTED FOR A WI-800 SUBSIDY?

ARE ANY OF THE URLs VISITED IDENTIFIED AS A SUBSIDY ENTITLEMENT TRIGGER?

PREPARE SSS SDRS
FIG. 31

ARE THE URLs VISITED LISTED FOR WI-800?

Y

ARE ANY OF THE URLs VISITED IDENTIFIED AS A TRANSACTION CONFIRMATION PAGE?

Y

PREPARE SSS SDRS

N

N